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AMIGA 3000**

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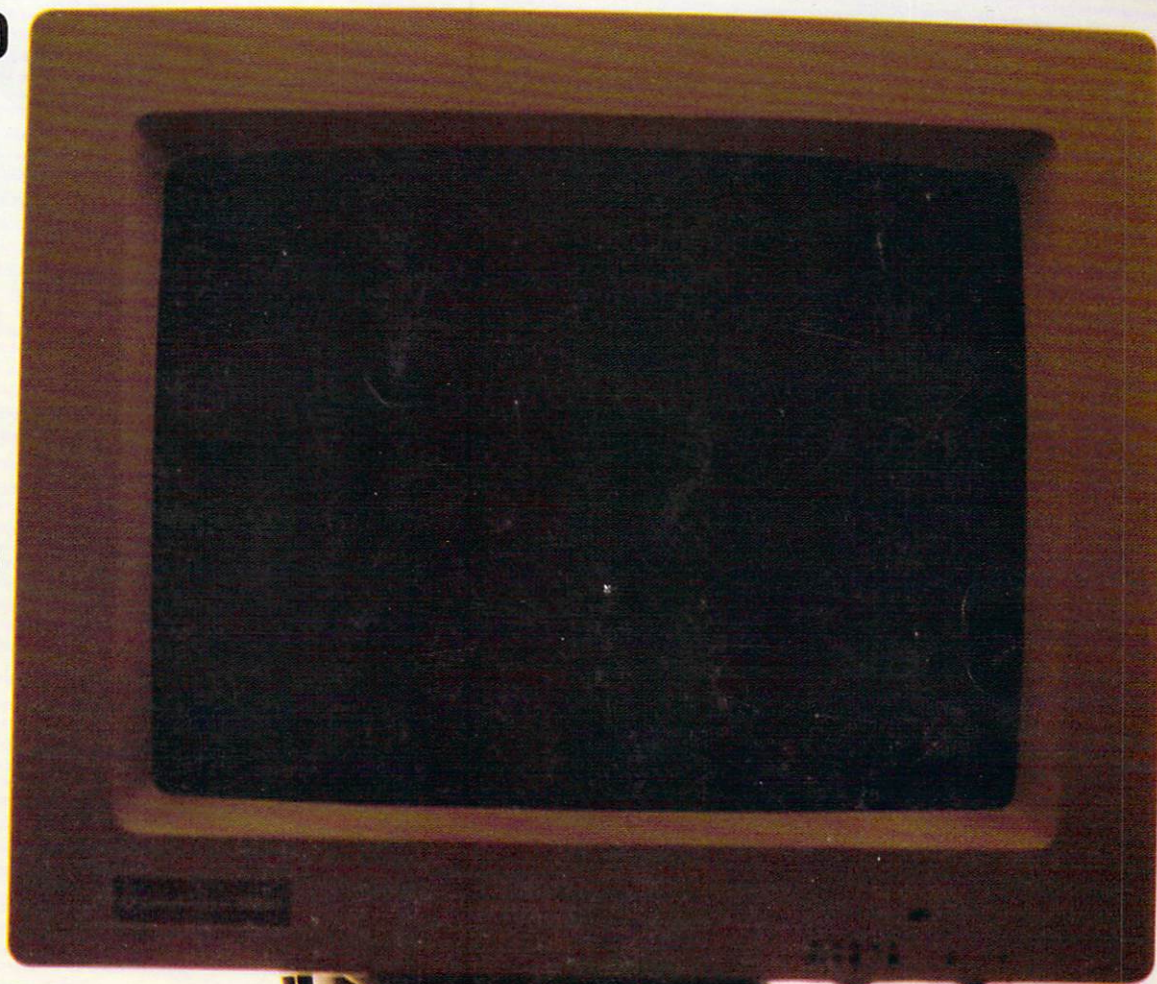
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TOASTER**

**TUTORIAL:
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**PROGRAMMING:
SUPER BITMAPS
IN AMIGABASIC**

**HARDWARE PROJECT:
TURN YOUR A1000 INTO
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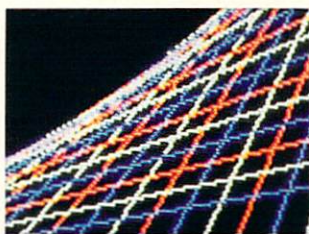
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"From the A3000's sleek new case design to its advanced electronics, Commodore has redefined the art of Amiga computing."

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The AMIGA 3000: Creating Choices

Wow, what a month. This issue of AC brings us the first glimpse of Commodore's newest entry into the Amiga line, the A3000, as well as NewTek's long awaited Video Toaster. With both of these hardware advances aimed squarely at the professional market, the strength of Amiga computing is now greatly amplified.

The A3000 is an Amiga workstation. It is already able to address 1 Gigabyte of Fast RAM. That's more than either Apple's Macintosh, IBM's PC/2, or NeXT's computer can handle. It is also more than the current chip design can supply. Commodore is expecting the memory chips to advance in density the way they have for the past ten to fifteen years: quickly. They have designed the Amiga to take advantage of these advancements as soon as they are available. They have created a workstation capable of expansion beyond any of our current possibilities.

The A3000 will become the perfect tool for advanced graphics and video manipulation. Its large memory and accelerated architecture provide an excellent platform for advanced ray tracing, complex animations, large graphics manipulation (the A3000 provides a SuperHires feature), and more. These are the tools that will be necessary to produce feature films, computer-generated advertisements, and multimedia presentations.

The A3000 has the muscle to be an advanced business computer. The ability to network the Amiga is now being addressed by companies such as ASDG, RCS Management, and Commodore. ASDG and RCS Management have already supplied Ethernet cards for the A2000, and these should be compatible with the A3000. There are also alternative networking solutions currently being developed for the Amiga. Such developments would make the Amiga a central figure in business applications.

The Amiga 3000 represents the third tier in the Amiga line of computers. Comprised of the Amiga 500, the Amiga 2000 series, and now the A3000, the Amiga product line offers the most complete array of computing abilities anywhere. From the low-cost, yet powerful A500, to the higher

priced and much more technologically advanced A3000, Commodore has created an unparalleled variety of choices. It is in this strength of choices that we can underline the need for each machine.

Scrap the A2000?

Most of us who own the A2000 will now wonder if our machine is not obsolete. Let's be honest: most of us purchased an Amiga so we could have the hottest technology available. We liked the idea of having a computer which could outperform our neighbor's. It is discouraging to see this advantage erode, even if this erosion is caused by the introduction of a better Amiga.

Take heart. The A2000 and A2500 computers are far from obsolete. Yes, they do lack the current addressable memory expansion of the A3000 but, with its current level of chip design, the A3000 cannot take advantage of more than 16 megabytes of memory expansion. As far as speed, the A2000 has advanced in both speed and memory through the work of companies such as Aminetics, Advanced Computer Design, Commodore, Computer Systems Associates, Great Valley Products, and Imtronics.

GVP now supplies a 33 MHz 68030 board for the A2000; they promise a 40 MHz version shortly. Also, GVP is currently creating the first 68040 card for any computer. This card will advance the A2000 computer to a higher CPU than the A3000. To be honest, GVP will be hampered by the limited availability of 68040's for some time and this is the exact reason the A3000 is equipped with a 68030 CPU.

Confused? Don't be. This is the natural evolution of computers. A need is perceived by the developing community and in response several intelligent solutions are supplied. This does tend to blur the differences between the hardware possibilities. Still, while we are not presented with a cut-and-dry decision as to which computer to purchase, we can combine and alter our equipment to accommodate our needs.

The basic advantage of the A3000 is that it supplies these expansions within a

single unit. It is more expensive than an A2000, yet the A2000 will cost more to expand to this level. One of the basic problems with owning an Amiga is that you are given a plethora of choices.

If you are wondering whether your current machine is what you need, I can offer this small bit of information. We were permitted to see the A3000 before its launch. We were allowed to read some of the advanced documentation and inspect the design of the machine. We knew the pricing and the options available on the A3000.

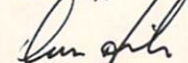
Two days after we shipped the A3000 back to Commodore, we purchased an A2000 through Commodore's A1000 to A2000 upgrade plan. We have the option of doing this three more times (provided we do it by the end of April) and we probably will.

Why, if we have seen such advanced equipment, would we decide to buy more A2000's? The A2000's are what we need. They are reasonably priced, they are expandable, and they are available. They offer solutions to our computer problems today.

None of us decided to buy an Amiga because it was OK. We purchased these computers because they presented the best solution to our computer needs. I am very pleased that Commodore is developing such a wide line of Amiga options. Their work has paved the way for a full line of complimentary machines. Oh, in the future these will develop a split in the way each computer runs its operating system. It is only natural that systems will be modified to take advantage of the new hardware architecture and advanced software techniques.

But, for now, it is nice to know that I can play Battlehawks 1942 on an A3000 or write the great American success story on my A500.

Sincerely,



Don Hicks
Managing Editor

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FEEDBACK

Dear AC:


I just wanted to give you some comments on your magazine's illustrator, Brian Fox. I haven't read any praises of him as yet so it's about time. As an amateur cartoonist, I can appreciate his excellent work with pen and ink. His painting in your special games issue was a nice piece of work, too. More importantly, I've noticed that some of his more recent illustrations in your magazine seem to have been created on the Amiga. This is great!

An illustration can really liven up a magazine article and bring more interest to an otherwise drab (albeit technical and very informative) document. Mr. Fox has definitely made a big improvement to AC's look and readability.

Keep up the good work, AC! I would like to see Brian Fox challenged with creating more art using the Amiga computer. How about more work with Professional Draw, which might be closer to his great pen and ink accomplishments.

Thank You
Rick Rudge
Milwaukee, OR

-Thanks Rick. I'm sending a few photos your way. I hope you enjoy them. -Brian



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Dear AC:

MINIGEN VIEWING SOLVED

Having bought the Progressive miniGen, I came across the same problem as other miniGen owners: not being able to see what you are recording.

I am happy to say I have solved the problem. While in a Radio Shack store I came across an Audio/video 3-way distribution amplifier, Cat #15-1103, price \$29.95.

Plug your miniGen into your Amiga, connect your cables to the amplifier and the genlock, switch over to the composite mode and you can see and hear as you record your projects.

I hope this will help other miniGen owners with their desktop video projects.

Carlton Connelly
Detroit, MI

Dear AC:

First of all I want to thank all the people responsible for making AC what it is today. More power to you!!!!

I would like to know what happened to Gregory Tibbs' Rejuvenator for Amiga 1000. In AC V4.10, I was made to understand that it would be available sometime in Dec., 1989. But until this time, I have not seen or heard anything about its existence. Are we still to expect its birth? If so, WHEN and WHERE can I get one and at WHAT PRICE? Also, I would like to find out if there will be any problem if it is installed in A1000 with Chris Erving's additional 512K piggy-backed RAM expansion (Hardware Project, AC V2.1).

I am not [asking] for my letter to be published. I only need to know about the Rejuvenator for my Amiga 1000. Please do not fail to reply.

Sincerely,
Andres O. Santos, Jr.
Astoria, NY

-We have received many questions regarding Gregory Tibbs' A1000

Rejuvenator. We have learned that the Rejuvenator is being distributed by Expert Services. Contact Expert Services, 5912 Centennial Circle, Florence, KY 41042 (606) 371-0913. Or circle Inquiry #236 on the April reader service card. -Ed

Dear AC:

Those readers who typed in the listing from my article *An Amiga Conundrum* (AC V5.2) can squash some small bugs by adding four lines to the IF-THEN-ELSE block in the 'Move' routine (top of page 89), giving the following amended version:

```
IF (x>136 AND x<287 AND y>29
AND y<156) THEN
  Tries:=Tries+1
  TIMER STOP
  LOCATE TriesLin,TriesCol
  PRINT USING "####";Tries&
  TIMER ON
  GOTO SwitchColors
ELSEIF (y<128 OR y>162) THEN
  GOTO Move
ELSEIF (x>60 AND x<102) THEN
  TIMER OFF
  Flash X5+57,Y5+7,NextGame()
  GOTO NewGame
ELSEIF (x>11 AND x<53) THEN
  TIMER OFF
  Flash X5+8,Y5+7,Quit()
  GOTO GetOut
ELSE
  GOTO Move
END IF
```

Yours Truly,
Dave Senger

•AC•

(All letters are subject to editing. Questions or comments should be sent to:

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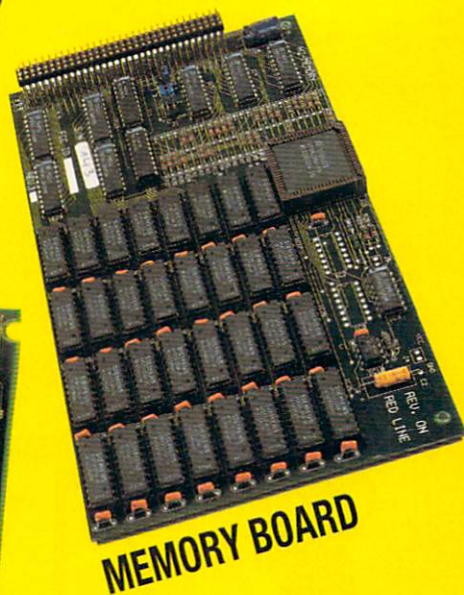
board turns your Amiga 500 into a 32-bit work station and is extremely easy to install in the 68000 socket. A performance of over 500% is possible with the 68020, additional performance increase can be reached with the 68881/68882 FPU of up to 33 MHz. The HURRICANE 500 is hardware switchable between the 68020 and the 68000 operation.



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getting started with

by David Johnson

DELUXE VIDEO III

For years, I have been scripting animations using The Director. The awesome power offered by that venerable program was always tempered by its interface. Despite the simplicity of The Director's scripting language, I just can't say I ever enjoyed the task of coding and then de-bugging my videos. Sure, some of the library routines helped. Whoever wrote the Enhanced Blit routine from the Toolkit disk deserves a Congressional Medal of Honor. I always knew that someday, something easier to use but equally powerful would come along. And when it actually did, I was awfully skeptical.

Everyone has by now seen the advertisements. Electronic Arts poised a screen shot of The Director next to one from DeluxeVideo III.

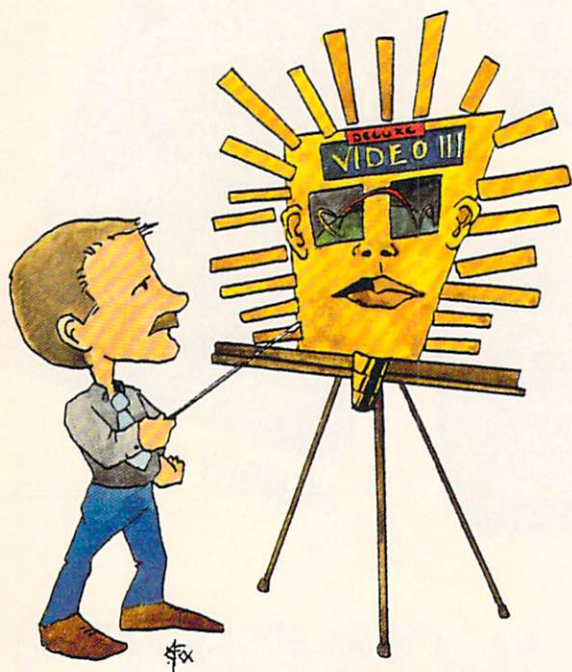
The point made was the astounding difference in interface: DVIII is completely graphical, using the analogy of a time line. One simply inserts icons which represent video effects (wipes, animations, etc.) at the proper point in the time line. DeluxeVideo really is as powerful as they claim, and what we are going to do here is simply create some interesting effects with the program to get budding videographers going.

What we're going to create is a short video to show off a new program; let's make it a specialized database. The first thing we need

to do is create some sort of storyboard. DeluxeVideo III is simple enough that we could make it up on the fly, but a little preparation always goes a long way. We want three basic scenes:

1. Title screen. The company logo will wipe in two colors. A fireball falls from off the top of the screen, and after contacting our logo, the logo lights up in full color.
2. Introduction. Some lines of text serve to tell the viewer why they should buy our product. We'll add an interactive interface to this screen.
3. The program. A self-motivated pointer whizzes around the screen, pointing out interesting aspects of the program. A textbox appears beside the pointer at opportune moments, illuminating such features. As many additional screens as necessary can be added at this point, but we'll make do with one, and simply wipe into another.

Now that we have outlined what we want the video to do, we need to get the parts. While it is very easy to multi-task DeluxePaint III with DeluxeVideo III (it's



• T U T O R I A L •

almost as if they were made for one another), we'll set up what we need now. We know we want some screen shots of the program in question. The easiest way to do this is by using a program like the public domain utility ScreenX 2.2 (by Steve Tibbitt). We also want a pointer, so we'll make one in DeluxePaint. Draw it big enough to catch the viewer's attention, but not too large or it won't move smoothly in DVIII. I've found the best size to be around 100 by 65 pixels. Be sure to use the palette from your screen shots when making the arrow. Save a copy of this brush pointing in both directions. At the same time, make a matching box, about 200 by 100. Make a few copies of it bearing some text; these texts will describe what the arrow is pointing to in the video.

Finally, we're going to animate this brush. Set the anim controls for 6 frames and stamp down a copy of the arrow. About 10 pixels away, stamp down the empty text box. Pick up both of them as a single brush, and stamp it down. Hit "undo." Using the move requestor, set the arrow and textbox combination to rotate 180 degrees without moving; simply type "180" in the Y angle requestor. Turn off "cyclic." After drawing the animation, save it as an animbrush.

We have one last project in DeluxePaint before we can get into DeluxeVideo. This one is quite easy; we simply need to make an animated fireball. It only needs to be a three or four frame animbrush; once done, exit DeluxePaint and boot DeluxeVideo.

We will be working in the "expert" mode, so select that now. The important thing to remember about "expert" is that it offers many new effects. As the manual frequently points out, "expert" mode doesn't protect the user from telling DVIII to perform irrational acts, but then again, nothing you do is ever fatal (unloading a picture that hasn't yet been loaded, for instance, will not cause DVIII to crash), so there's no harm in using this enhanced mode.

Our first scene will feature the company logo, as we discussed above. The major effect we are trying to achieve here is that of making the logo suddenly burst into color from monochrome. While there are many ways to achieve this, the following procedure works fine.

...though DeluxeVideo III is an amazingly simple program to use, there are so many effects available that it is easy to overlook many brilliant features...

Pull down a few tracks. The first should be a Backdrop track. Set it for the screen resolution you want to work with, and add a show effect at 0 seconds. Get a Textline track. Choose a colorfont, but don't use the colorfont utility to turn on



Creating a video with DVideoMaker.

colorfont mode yet. Type out the logo name and hit OK. In this case, it would be NS, short for Newt Software, my cat's successful company. Reveal the text however you like with a WipeIn effect at about the 4 second mark.

Next, go get a brushanim track and select the fireball. We need two effects, both beginning very soon after the text is fully visible. First, select PlayAnim. Make sure the requestor reads both "forward" and "continuous." Next, select MovePath. Trace a path from the top of the screen in a natural arc to hit our text. Remember to use the "h" key to reduce the magnification of the screen. When you're done, view what you have so far. If you don't like the speed of the fireball, change it with the "timestep" gadget in the MovePath requestor. Insert an Unload effect when the fireball arrives at its destination. It is a good idea to always Unload a part as soon as you're done with it, in order to get that memory back. If you like, you may also add another animbrush at this point that makes the letters look like they're exploding.

Now comes the interesting part. Run your colorfont utility, add another Textline

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track and select the same font and text again. WipeIn the text a moment after the fireball appears; the letters will appear to fill with color. Some WipeIn effects will definitely work better than others; the random dither looks quite good. All you need to do is fade out the text, make sure you unload everything, and this scene is complete. After closing the scene, drag the end-of-scene pointer as far to the left as DVIII will allow. This ensures that you shorten the scene as much as possible, eliminating dead space that has no action.

Scene two is quite simple. Add a new Scene effect to the video track, and make sure it begins immediately after scene one ends. Add another backdrop track. Add Textline tracks to your heart's content. Experiment with various wipe effects, and let the text read something like "Newt Software", "proudly presents", "an integrated", "veterinary database". Time the Textlines to WipeIn at overlapping intervals by adjusting the Wipe effect's time position and duration.

We have two choices now. You may simply fade this scene out, or add a button to let the viewer decide when he's seen enough to move on. If you haven't tried this aspect of DVIII yet, give it a shot now. It is a tremendously powerful tool for creating interactive videos. Make a small button in DeluxePaint (multi-tasking is for people who can't plan ahead). Add the Brush track and Show or Position it as you wish. Next, add a GoTo effect to the brush, right at the beginning of the scene. Label the effect "finish." Next, add a Control track and attach a Wait effect at the first moment that your titles are completely drawn. Finally, attach a Label effect to the Control track at the very end of the scene. Name the Label "finish." What you have done is told the video to "wait" for a mouse input. When you click on the button, it fires the GoTo, and looks for a Label on the Control track of the same name. It then skips ahead to that point in the time line and executes effects from there.

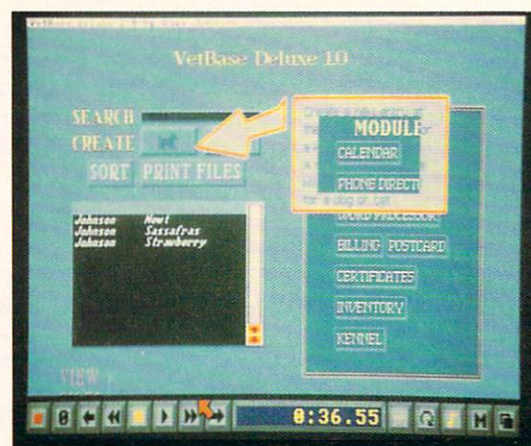
Now we're up to the meat of the video; we want to show off the program. One of the nice things about DVIII is that you don't need to work with the finished images right away.

Substitute any image, preferably one that bears some resemblance to what you eventually want to use. When you have the part you want, give it the same name your sub had been using. This would allow you, in the case of this video, to develop the demo at the same time as the actual product, substituting screen shots from the beta version until it was complete.

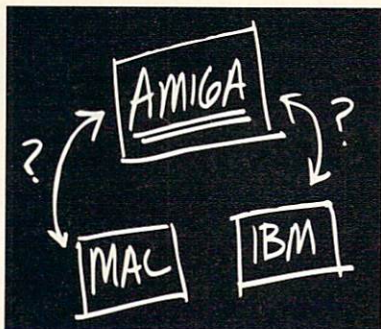
In any event, start a new Scene and get a Picture track. For a real attractive entrance, choose SlideIn. Pick the four direction icon and the slide button from the requestor. Set the duration to about 1 second. Now we get to show off our arrow. Get a Brush track and set up a MovePath effect. Using the "h" key, draw a path from off screen to some point of interest. Add another Brush track and assign this to one of the textboxes you drew in DeluxePaint. Attach it to the arrow track using the arrows at the far left of the track icons. Position the brush about 10 pixels away from the arrow at the same instant the arrow comes to a complete stop. After a suitable pause, cause it to WipeOut by selecting "four way" and "solid" from the requestor. The duration should be 1.5 seconds.

Placing a new MovePath effect on the arrow track, move the arrow to a new position from its previous spot. When it arrives, Position text again. This time, we want the text to disappear without losing the textbox itself. Add the animbrush of the revolving arrow to the scene. This image has an empty textbox attached to the arrow. Position it so that it is in exactly the same location as the separate arrow and

(continued)



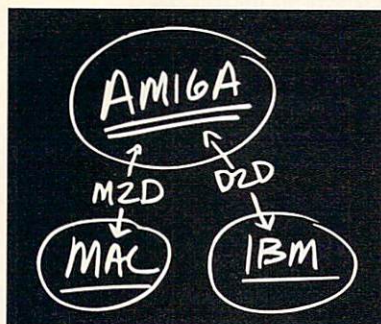
The scene script for the animated arrow and textbox, ready for play.



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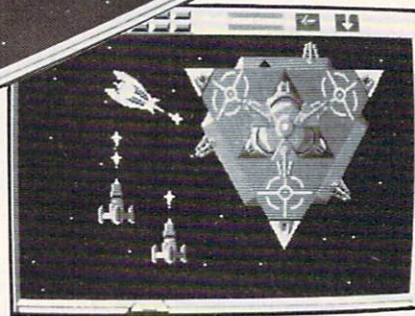
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textbox brushes. Add a PlayAnim effect. Be sure it is set to repeat only once. At the end of this animation, add new Brush tracks for the empty textbox and arrow pointing the other way, and Position them at the moment the anim is complete. It may take some trial and error to get these positions precisely.

Now, for the last effect of this scene, suppose there is more information about a particular feature than will fit in a single textbox. There are any number of elegant ways to do this. After a pause for the viewer to read the first box, initiate the same WipeOut on the textbox track we used above. Halfway through this effect, begin a WipeIn on the track for the next textbox. Specify the same settings as for the WipeOut. As the first box disappears from the center out, a new box appears in the void created by the first box. Finally, we can WipeOut the arrow using a random dither, and it will seem to dissolve onto the picture behind it.

Supposing that you were to carry on with the demo at this point, there are two very interesting ways to move onto the next picture. Using a WipeOut effect, you can simulate a page-flip by using one of the diagonal wipes with the diamond pattern from the requestor.

Alternatively, it is possible to dissolve directly to the next image by using the Pattern effect. Pattern effects aren't a part of my definition of "intuitive", so let's try it out. Add a new Picture track; this is the second screen we want to show off in our program. Attach a Perspective effect where we're going to begin our transition to this next screen. Because both screens are the same size, use the default settings in the requestor. Finally, pull a WipeIn effect down to the current picture. It is very important that this effect (1) go on the picture track you are trying to get rid of, and (2) take place within the duration of the Perspective effect on the other track. Also, make sure that the new picture is attached to the old picture using the arrows at the far

left of the track. If everything is "hooked up" right, you can experiment with a multitude of wipes in which the new image bleeds in over the old one.

As you can see, we've only scratched the surface of what is possible with DeluxeVideo III. I've tried to demonstrate some of the niftier effects possible with the program that didn't get their fair share of coverage in the manual. Though DeluxeVideo III is an amazingly simple program to use, there are so many effects available that it is easy to overlook many brilliant features. I hope that crosstalk such as this helps new users experience the full potential of one of the most powerful professional tools available on any computer.

•AC•

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NEW PRODUCTS & other neat stuff

by Greg Young

DRAGON THE LINE

New from Media Technology Limited, in cooperation with Visionary Design Technologies, is **Dragon's Lair: Escape From Singe's Castle**. Here you, as Dirk the Daring, are called upon to rescue the fair to middlin' Princess Daphne from the deepest, darkest dungeons of Singe's Castle.

Being a dragon, Singe The Evil Shape-shifter naturally does not keep a very tidy Castle; therefore, it ain't easy doing your daring deed (then again, it never is). This game, with its laborious labyrinth of caliginous rooms, its poisonous plethora of antediluvian instruments of torture, and its homicidal hords of sanguineous spectral fiends, is happily entirely different from the original! Matter of fact, a special LINK feature built into this stirring sequel lets you install both parts to any hard drive and play them as one complete adventure for "the ultimate playing experience".

Escape From Singe's Castle is not copy-protected and requires a minimum of 512K memory; multitasking is accommodated throughout loading and gameplay. A new technology—Burstloader—loads rooms 10 times faster, while a selectable HELPER serves as just that, and even works on Dragon's Lair Part I if LINKed. Three difficulty levels allow just about anyone to play at their own pace.

*Dragon's Lair:
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MORE MUSIC, MORE MUSIC

Hologramophone Research has officially announced an interesting twin release of music products for the 1990s.

Musical artistry takes on a whole new meaning with the fully multitasking **Pixound**, a color graphics screen interpreter that generates music by translating the red, green and blue content of each pixel into chords, built on any of 60 scales. Capable of using both MIDI and Amiga internal voices, Pixound lets you create pictures to produce desired musical effects, and allows you to enjoy the aural nuances of your favorite graphics and fractals; thus, every new screen is a new instrument to be played.

You are provided six unique screens and 13 screen generators (which never produce the same screen twice) within Pixound itself; by moving the mouse around the screen and using options provided on the fully mapped keyboard to vary pitch, harmony, orchestration, rhythm and scales, novice musicians and computer users should "automatically" learn the basics of music theory.

Serious musicians will use Pixound's MIDI recording capability to generate sequences for use in other music programs—according to Hologramophone, some "world renowned musicians" already have.

The company's second new release actually consists of 4, 4, 4 interrelated programs in one(!), centering around the title program **Hyperchord**; the others are *Mode Maker*, *Rhythm Maker* and *Holistic Window*.

Hyperchord is a dynamic riff sequencer which allows users to create

short musical themes which are then stored and manipulated—as to rhythm, pitch and order—in real time, thus creating larger musical movements.

In the Design mode, you can create very simple to highly complex riffs; or, any of 30 riff sequences are created for you from the package's Grab-bag feature. In the Play mode, you can switch between any of 60 tonal modes, or alter pitch, speed (up to "lightning fast" for emulating the youthful Jimmy Page!), rhythm, note order, trills, orchestration and more, as you loop and otherwise improvise with any of the riffs in the Riffbank.

Mode Maker lets you customize the 60 preset tonal modes, while Rhythm Maker allows the creation of 39 custom rhythms, from a "palette" of 13 durations, from 64ths to whole notes. Finally, Holistic Window is a 3D graphic interface providing a visual depiction of what is happening in Hyperchord, for a clearer understanding as to the inner workings of sound.

*Pixound
Hologramophone Research
6225 S.W. 145 St.
Miami, FL 33158
(305) 252-2661
Price: \$99.00
Inquiry #208*

*Hyperchord
Hologramophone Research
6225 S.W. 145 St.
Miami, FL 33158
(305) 252-2661
Price: \$159.00
Inquiry #209*

HERE COME DA JUDGE ...

Has the recent and now all-too-frequent return of Perry Mason to the small screen served to whet your appetite for the bang of the gavel and things jurisprudential? If so, there is now a way to experience that excitement firsthand, without ever having to come in contact with a REAL lawyer (the worst kind).

It's FairBrother & SoeparMann's **Courtroom 1.0**, a game encompassing both legal affairs drama and precisely authentic courtroom procedures. While billed as a package capable of providing the aspiring attorney or law student with authentic out-of-docket experiences, its makers claim that even non-legal thinkers will find Courtroom to be stimulating; in fact, it may bring about "an improvement in your mental acuity, and a honing of your ability to spot invalid reasoning."

Play against the computer or against a friend—Courtroom runs on any Amiga with 512K or more of RAM. Use Courtroom as your boot disk with 512K to hear testimony via the last-minute speech option; with more than 512K, you'll get sound either way.

Courtroom
FairBrother & SoeparMann
5054 S. 22nd Street
Arlington, VA 22206
(703) 820-1954
Price: \$49.95
Inquiry #210

HERE'S ONE FOR THE KIDS!

In the words of The Knox Family, developers of the **Ready Robot Club Disk Magazine**, this product will be "a continually evolving system of ideas, values, ideals and activities" designed for children in grades K through 6. It's set to officially debut in June.

Not just a collection of PDS or shareware, this bimonthly disk magazine will contain all-original programming, graphics and sound, and will include features that are both educational and fun: science experiments, illustrated stories, riddles, songs, reviews, games, adventures with Ready Robot and

friends, a coloring book section, Parents' Corner, and more.

Kids who become Ready Robot Club members will be encouraged to contribute their own pictures, stories and reviews through membership incentives such as certificates, awards and official caps and stickers. Distributor "Signs Etc. by D. Knox" expects Ready Robot to spur children's Amiga activities worldwide, and become a prime source of computer information for kids. Of course, that may depend a great deal on whether or not moms and dads agree with Knox's perception that they have priced the magazine under a system that's "financially easy on parents".

Ready Robot Club Disk Magazine
Signs Etc. by D. Knox
P.O. Box 628
Carmichael, CA 95609
(916) 944-4282
Price: \$28 for 3 issues
\$48 for 6 issues
Inquiry #211

BUT HOW DO YOU FOLD THE THING?

COMPUTE! Books has just published a new 446-page Amiga reference guide which is billed as "the only source that includes full descriptions of every Amiga hardware register and an element-by-element breakdown of each Amiga system structure."

Mapping The Amiga consists mostly of tables and charts of programming information, with a complete listing of library functions with syntax given in C, machine language and



It's so hard to be a saint in Singe's city: Dirk the Daring in Dragon's Lair: Escape From Singe's Castle.

Modula-2. Functions are ordered alphabetically rather than by library, which should endear the publication to beginner and expert programmer alike.

This might be the only book ever published that has more appendices (five, comprising Hardware Programming Examples, Printer Codes and Guru Meditations, plus charts on two other topics) than chapters (three, titled: Library Functions, Structures, and Hardware Registers).

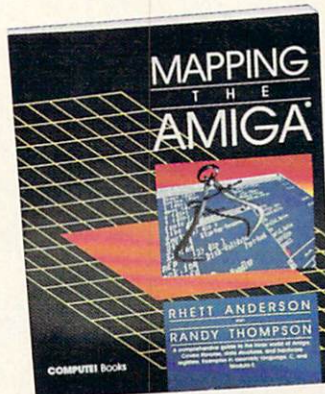
Mapping The Amiga
Chilton Book Company
One Chilton Way
Radnor, PA 19089
(800) 345-1214
Price: \$22.95 +
\$2.00 P & H
Inquiry #212

IT CHOPS, IT SLICES, IT DICES ...

"Be a better blender"—inspirational words no doubt proclaimed by Fred Waring more than forty years ago, and echoed anew by Delta Graphics with its introduction of **Ham It Up!**, which lets you display and print all 4096 Amiga colors as 16 256-color charts. No HAM paint program is required to view or print the output, which represents a complete color reference guide for all Amiga artists.

Included are tutorials to aid video animation artists in achieving smooth background blends, thus avoiding those unwanted "fringe" effects. Hours spent in the oft-times

(continued on page 17)



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frustrating process of color selection and matching are dramatically reduced through your ability to print out all of these colors and blends on your own printer.

RGB values are given for each color, and the manual also comes with Blend Worksheets and Blend SpeedSheets, all designed for incredibly quick and relatively easy palette-building—and more time spent in the actual creation of art!

Ham It Up! is not copy-protected, and requires a minimum 1 megabyte of RAM. A Ham It Up! Extras disk gives you SuperBlue, which lets you view all 16 color charts on one screen, and print them together on one page. SuperBlue requires the 1 megabyte Agnus chip to view, and a SuperBitmap HAM paint program to print.

Ham It Up!
Delta Graphics
48 Dighton St.
Suite 2
Brighton, MA 02135
(617) 254-1506
Price: \$39.95
Inquiry #213

TWO FOR YOUR BASE INSTINCTS

What's this sudden deluge of new products designed to free up one hand during joystick play? Well, actually it's only two products, but I'll jump at any chance to use the word "deluge".



Yes, you can take the vice off your computer desk now and return it to the workbench (not that you're actually going to use it there, bucko). Duggan DeZign Inc. of Rhode Island announces the new improved **Stik-Gripper**, which is basically a fairly attractive modification of that popular carpenter's helper. Nevertheless, it is well-made (hey, how many new products do you know of that are actually made of good ol' polished American steel?), gives your joystick that arcade feel, and frees up your other hand for keyboard play—or whatever else comes to mind! Stik-Gripper attaches to any tabletop up to two-and-a-quarter inches thick, and

clamps any joystick up to four-and-five-eighths inches wide, and up to two-and-a-half inches thick.

Not to be outdone, New Hampshire's The Softwaresmith has introduced **Stik-Foot**, which is more like a non-skid breakfast tray-sized base for joysticks that doubles as a lap-held mouse pad. Wow! The standard model uses adhesive squares (in lieu of suction cups on your joystick's base) to achieve semi-permanent attachment of joystick to product, while the "removable" model allows repeated attachment and removal through the use of hook-and-loop fastening tape (i.e., Victor Kiam's long-lost investment opportunity, velcro). Stik-Foot permits simultaneous use of joystick and keyboard and precludes any marring of furniture because the product itself does not fasten to your tabletop.

While Stik-Gripper may already be available at your local Amiga dealer,

Stik-Foot probably is not; it can be ordered directly by writing to The Softwaresmith.

Stik-Gripper
Duggan DeZign Inc.
300 Quaker Lane
Suite #7
Warwick, RI 02886
(401) 826-2961
Price: \$18.95
Inquiry #214

Stik-Foot
The Softwaresmith
Suite 131
114 Daniel Webster Highway South
Nashua, NH 03060
Price: \$5.99 +
\$1.50 S & H
Inquiry #215

...AND A PARTRIDGE IN A PEAR TREE

You young prince of a guy, you—get out there and help your old man restore tranquility to his once-so-peaceful kingdom of Morenor, before the evil goddess Medusa can win all of his subjects into her diabolical power, and spoil the whole darn thing.

But unless you are an absolute star of the Amiga games world, you'd better bring along a big hunk o' patience—Star Games estimates that it takes the "average player" three months to solve the task put forth in its new **Rings of Medusa**; that is, to find five hidden rings in the kingdom and place them together in the temple of Athenians to call Medusa to battle—and win!

Along the way, you must raise money, acquire (and then pay monthly) a loyal army, trade with towns, attack caravans, ships and towns to seize treasures, and perform the myriad other adventuresome sorts of tasks normally required of one during the successful pursuit of quests such as this.

Rings of Medusa requires a minimum 512K memory to display some pretty fine and well-detailed graphics depicting a world of 33 cities, 13 castles, 3 islands, a score of goods for trade and numerous enemies (drat!).

OTHER PRODUCTS RECEIVED

The Third Courier
Accolade
550 South Winchester Boulevard
Suite 200
San Jose, CA 95128
(408) 985-1700
Price: \$49.95
Inquiry #217

Infestation
Psygnosis Limited
122 Century Building Tower St.
Brunswick Business Park
Liverpool, England L3 4BJ
Price: \$39.95
Inquiry #218

Amiga C Manual ("Amiga Suites") V1.00
Amiga C Club (ACC)
Anders Bjerin
Tulevagen 22
181 41 Lidingsö
Sweden
Price: \$25
Inquiry #219

Rings of Medusa
Star Games
708 W. Buffalo Ave.
Suite 200
Tampa, FL 33603
(813) 222-0006
Price: \$49.95
Inquiry #216

•AC•

upgrades fixes updates new releases

bug bytes

by John Steiner

I thought my mailbag was going to burst this month with so many letters from readers.

Mike Luther of Laurel Bay, SC was first on the list with a request for some information on how to run the original Transformer software on an A500 or 2000, since Transformer was designed to run under Kickstart 1.1, and does not run at all on later version Kickstarts. I know I have seen a patch for this somewhere, but do not know where he might locate it. If you know the name of the patch, and how it can be obtained, let me know. I will pass it along.

MaxiPlan is an Amiga-based spreadsheet program I have been interested in since early in the Amiga's history. It has gone through several upgrades and name changes, and can be found under the name of MaxiPlan III Release 3.5 as of this writing.

It would appear that there are still many problems with the latest release of the program judging by the letters I have received and comments I have noticed on the information services. While bugs that appear in programs are a problem for the end user, what distresses me more is the apparent lack of concern for the end user that the technical support staff at Intuitive Technologies displays. Every letter I have received notes that the writer has called and/or written on more than one occasion, and no one from Intuitive Technologies bothers to respond. Their technical support number is connected to an answering machine and the message states that no one is currently available

to answer the telephone, but leave your name and number, and they will return your call.

Just one example from a reader: "...I ordered the MaxiPlan III upgrade in mid-October, they billed my VISA card for it the first of November, they sent me a letter about a delay due to the earthquake (a good excuse) in mid-November, they promised shipping in a few days in mid-December, they stopped answering the telephone in mid-December, they dated the shipment letter early January but didn't ship until late January (there are files on the disk dated late January!!), and they won't let me talk directly to customer service (I either get a recorded message to leave my number or they take my number because customer service isn't available right then) and refuse to return my calls..."

What follows is a condensed list of problems mentioned by Bug Bytes readers. The problems listed here may or may not be with the program, but may be caused by incorrect usage of the program. Since Intuitive Technologies technical support doesn't seem to be willing to help these users, all I can do is list the problems that are occurring, and ask other MaxiPlan users about them. If you recognize a problem listed here, and have a workaround for it, or know if the problem is a user error, drop me a note, and I will publish the information in a future column.

Here is the list:

- *The COLOR function worked in previous releases, but does not work in this release.
- *The INDEX function does not work as advertised in the manual, and seems to only return ERROR messages.
- *When comparing strings in an IF statement, they always evaluate to 'TRUE'.
- *When you try to freeze columns or rows, the spreadsheet will only freeze A1.
- *Some functions, such as replicating formulas,

expand the spreadsheet to some 2000 lines! Saving and reloading doesn't get rid of them. Cutting data to the clipboard, exiting the worksheet, creating a new worksheet and pasting the data back in will not get rid of them, and they print out!

*The spreadsheet does not clean up memory upon exit. When you exit the program, the disk icon won't go away. If you then run another application without rebooting the computer, it will Guru sometime during that application.

*Loading the spreadsheet program seems to cause various problems, as well. For example, it may cause you to visit the Guru when you double click on an older version MaxiPlan spreadsheet project icon, thus asking it to execute MaxiPlan and load the spreadsheet. This function does work if you increase the stack size in the icon's .info file. MaxiPlan then changes the stack size back the next time it saves the spreadsheet, and the .info file must be changed again.

*The Easy Sort function doesn't work properly, as cell references in the sorted columns don't reference replicated cells correctly.

*Print problems occur on large spreadsheets. The computer hangs up after printing only a few lines, necessitating a reboot.

I placed a call to Intuitive Technologies to ask them about their technical support policies, and left my name and telephone number so they could return my call. I left a message on their recorder that told them of my affiliation with Amazing Computing, and that I had received several letters from dissatisfied customers of theirs.

As of this writing, more than four days after I left my name and phone number, they have not returned my call. *Contact: Intuitive Technologies, 1199 Forest Avenue Suite 264, Pacific Grove, CA 93950, (408) 646-9147. Inquiry #220*

I received a letter from Riney Bryson of Portage, MI regarding PageStream version 1.8. He has some questions about the presentation of color images and text on the PageStream screen. Because the PageStream screen display is in high resolution, there would only be 16 possible colors (or shades of gray) available for color display. To conserve memory, PageStream uses a 2 bitplane (four color) display. Since Amiga images can use

palettes that are composed of any of the 4096 colors, and since more than one image can be on the page and displayed simultaneously, there is no way that PageStream (or any other desktop publishing program for that matter) could display images in color. Instead, they have chosen to display the image in black-and-white.

There is a function in PageStream that allows you to vary the screen representation of color text and objects, however. Just use the Change Screen Colors menu choice in the Global menu.

I received a letter from David Blair of New York, NY regarding Sculpt 4-D. You may recall I commented on his problem last month. He has followed up his postcard with a well written letter describing the problem with cutting and pasting hierarchies in more detail. It seems that the distributors of Sculpt 4-D told him that they will not be releasing an interim bug fix to Sculpt 4-D and instead will fix the bugs in an advanced, more full-featured version of the program.

He comments that he, and others who have bought Sculpt 4-D are professional artists with time and deadline constraints that must be met, and a bug fix to correct this and several other problems are in order.

Bill Brown of Babylon, NY reports that he cannot get Professional Data Retrieve to operate properly on his Amiga 2500. Abacus Software has confirmed the problem with the screen mask editor, and promised a bug fix. No date for a fix has been made available.

Glen Cyrille of San Juan, Trinidad wrote to tell of a problem with the Intruder Alert marketed by a company known as Software Terminal in Fort Worth, TX. After an attempt to contact this company, which has had their phones disconnected, he wrote to see if other readers might know if they have gone out of business or moved, and to find out if other readers may have solved his problem. Mr. Cyrille has been experiencing a problem with the software which has rendered unusable the ability to dial and make contact with a particular

telephone number when a breach is detected at a particular port.

His modem is an Avatex 1200 that functions properly when used with OnLine!, Procomm, and Access, and also supports the AT command set that is required with the Intruder Alert software. When an attempt is made by the software to dial a number, a blink of the Send and Receive LEDs on the modem indicate data transfer between the Amiga and the modem. The phone number, however, is not being dialed.

If you have any experience with this unit, especially with the Avatex modem, or know of any new location or distribution channel for the product, let me know, and I will relay the information.

Chris Morgan of San Jose, CA writes to comment on a couple of bugs in Pen Pal. He wants to know if there is a workaround for these problems.

When importing an ASCII file into Pen Pal, after setting the "Show all" and "ASCII" format and selecting the file to be loaded, a requestor box asks "Treat each new line as a new paragraph? No (RETURN) Yes". If the "No" option is selected, the program functions as it should. If "Yes" is selected, however, and the ASCII files were created from either Textcraft Plus or Dungeon Masters Assistant Vol. II, Pen Pal will act as if it is loading and has loaded the file, but will not return control back to the active window (or any other window for that matter.) It will, instead, slowly chew up memory until the system crashes.

The second problem Mr. Morgan found is that if you select "ASCII" or "Show All" while the directory is loading, the directory will abort and the "time" icon will display continuously. You can recover from this problem by clicking on "Cancel."

Mr. Morgan also noticed that when using full justification, the microspace justification feature seems to favor the left side of the page.

Ronn Black of Laurinburg, NC wrote to report of a bug he has found in the Fast File System on AmigaDOS 1.3 that can have serious consequences. After I read his description, I realized that this problem has occurred on my own system, which has two fast file hard disks that are often kept

CONTROL THE UNIVERSE!

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Arthur C. Clarke

author of 2001: A Space Odyssey

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Virtual Reality Laboratories, Inc.

2341 Ganador Court
San Luis Obispo, CA 93401 USA

Circle 121 on Reader Service card.

within a megabyte or so of being full. The problem occurs when you copy or save a file to a fast file partition which does not have sufficient space for it. The program starts copying the file to the disk and then the system pops up a requester saying that the disk is full. You then go to the Workbench or CLI and delete files on the disk to make room for the file you are trying to put on the disk. If you click Retry on the system requestor, the program will continue the file copy or save. The next time you try to access the file, you will find it has been corrupted.

Mr. Black found after some research that if you compare the file size of an original and a copy that has been interrupted by a full disk, you will find the second file will be larger than the original. It would seem that the part of the file at the place where the disk filled up is accidentally written out twice.

This problem has occurred on two different machines with 2 different hard disk controllers with the same results each time. Disks that do not have the fast file system do not exhibit the problem.

Commodore has confirmed this bug. Be wary of this problem especially if it

happens during a save, as the file may not be recoverable if the problem occurs and you don't resave the file.

Ronald Peterson of Peterson Enterprises has announced that the C-Light RayTracer can be upgraded to version 1.06 by sending \$15.00 and the two original disks to their new address, which is listed below. Bug fixes include the See3D stereoscopic viewer handles 640x200 images correctly, and the SAVE function will no longer unintentionally cause the program to exit.

Also, a BETA copy of the 68881 version of C-Light is available free to any registered user who sends a disk.

Contact: Peterson Enterprises, 7 Grove Street, Haydenville, MA 01039, (412) 268-0232. Inquiry #223

Gold Disk's new spreadsheet program "Advantage" seems to have a problem with the Deskjet printer. At least I could not get the program to print properly

to the deskjet the first few attempts I made at it. The problem is that columns don't seem to line up properly if there is text in the cells in the first column that has a ragged right justification.

Also, Advantage seems to round off numbers at less than the desired precision, even if you manually set the format to the number of decimal places you want. If you have a solution to either of these problems, please let me know.

ProWrite Version 3.0 should be shipping by the time you read this. The following is a price list for upgrading to this latest version:

ProWrite 2.5 to 3.0: \$50.00

ProWrite 2.0 to 3.0: \$60.00

ProWrite 1.0 to 3.0: \$75.00

To this, add \$5 for shipping in US, \$10 outside US. Add sales tax for Texas residents (7.75%).

New features in ProWrite 3.0 include support for up to five columns. There are many other enhancements throughout the program: things like forced line breaks, page count markers, shadow text style, an optional type-over mode, and many new user options. Contact: New Horizons Software, Inc., Box 45167, Austin, TX 78745, (512) 328-6650. Inquiry #222

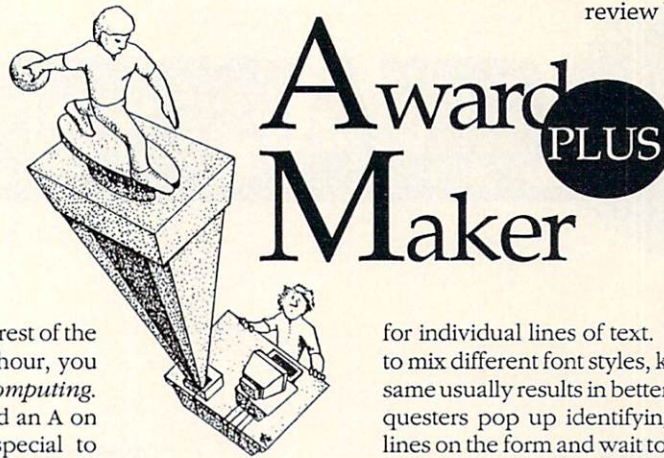
The Kurta Penmouse+ has improved software and can be upgraded to work with the Amiga 2000. The IBM-style I/O output adapter (Part No 10219-0001) you need to connect the Tablet to your serial port is \$12.50, and the latest Pencraft software version 3.0 is priced at \$25.00 plus your original program disk. Contact: Kurta, Attn: Amiga Software Upgrade, 3007 East Chambers Street, Phoenix, AZ 85040, (602) 276-5533. Inquiry #221

That's all for this month. If you have any workarounds or bugs to report, or if you know of any upgrades to commercial software, you may notify me by writing to:

John Steiner
c/o Amazing Computing
P.O. Box 869
Fall River, MA 02722-0869

...or leave EMail to Publisher on People Link or 73075,1735 on CompuServe

•AC•



It's late; all the Seven-Eleven's are closed. The rest of the family has gone to bed, so in the quietness of the hour, you settle down to read the latest issue of *Amazing Computing*. Suddenly you remember that your son has received an A on his term paper, and you don't have anything special to acknowledge this accomplishment. What can you do, what is the solution at this hour? Award Maker Plus, of course!

Award Maker Plus is perfect for situations such as the one described above. This program provides all the tools to quickly and easily meet most award and certificate needs. In just minutes a high resolution, professional-looking document is generated—one that you can be proud to give to anyone.

REAL-WORLD SOLUTION

Something similar to the above actually happened to me. I needed a gift certificate for a birthday present, as I planned to give my son free time on GENie (the on-line service), and wanted to come up with a unique way to present my gift. My solution can be seen on this page. This certificate was actually produced with Award Maker Plus, on my stock Amiga 2000 and a Panasonic 9-pin printer.

As you can see, the results are excellent, and the kicker is that the process is very easy and straightforward. All you need is an idea, the words, and this program. Actually, you need not even bring any creativity to bare. Included in the program are hundreds of pre-designed forms, complete with all the right words—just fill in names and dates, and you're in business.

DETAILS

Let's take a closer look at the program and its options, and then walk quickly through the process of generating a form. Your first operation is to select a style or format. There are more than 286 form templates from which to choose, the 46-page instruction manual gives examples of each available form. Included in these templates are 12 special forms that are essentially blank. These free-style templates allow plenty of flexibility so the program should be able to meet most user needs. My example is based on one of these freestyle templates.

After choosing the form, the next operation is to select one of the 10 available border patterns. A sample of each border with its name is shown. If you desire a border, a click of the mouse selects one. Next you're asked to choose a font. You can choose one font for the entire form, or select fonts

for individual lines of text. While it is possible to mix different font styles, keeping them all the same usually results in better-looking forms. Requesters pop up identifying the different text lines on the form and wait to receive your input.

At this point you can preview your layout. This preview function is Award Maker's only shortcoming. After a brief delay during which the form image is calculated, the award is displayed on screen. The image is small, and that's the problem. It's so small that the smaller text cannot be clearly discerned. While in most cases what you see is sufficient to proof the document, there are times that what actually prints out is not what you thought you had typed in! This is not fatal, it's just annoying and wastes time.

PROOF IN THE PRINTOUT

If satisfactory results are expected, careful alignment and centering of the paper is very important. To assist in alignment, guides can be used as positioning aids. When you're satisfied with the layout, just select PRINT AWARD. A few minutes later (the length of time depends on form complexity), a graphic dump produces a remarkable and most acceptable product.

CONCLUSION

Award Maker Plus is an effective and useful utility that would be a worthy addition to any productivity library. It operates on any 512k Amiga and requires Workbench 1.3, one or more disk drives, and a printer capable of doing graphics. Color output is possible with color printers or through use of color ribbons on standard printers. The program is not copy protected, so it can be easily installed and run from a hard drive. There is a save feature that allows you to recall and print any of your forms again. In addition to the main program, three supplement disks are available separately: Sports Award Library, Sports Cartoon Award Library, and Educational Award Library. These libraries extend the program's usefulness, and insure that you will never again be embarrassed at the last minute on a special occasion. *Product Info:* Award Maker Plus, Baudville, 5380 52nd Street SE, Grand Rapids, MI 49508, (616) 698-0888, Price: \$49.95. Inquiry #224





PERSIAN GULF INFERNO

The game was produced outside of Innerprise itself; hopefully, they will be much more careful with quality control in the future. The Amiga is capable of so much more, as displayed in Battle Squadron. Don't write off the company yet. Persian Gulf Inferno can be fun to play in spite of its failures, just don't pay full price for it.

IRON LORD

I have been told that you should start by just focusing on parrying his shots, then after he tires a bit, press home your attack. It is too bad that they made this segment so difficult. The game actually has good potential and while it is not the best adventure I have played, I was actually enjoying myself when I solved some of

the problems without any clue book. But when I kept getting killed by assassins I gave up and quit the game.

STARFLIGHT

In case you haven't noticed from past columns, Space games are among my favorites, and therefore I was very pleased when I found that Binary Systems had finally ported Starflight to the Amiga for Electronic Arts.

You begin the game on the planet Arth, a colony of the Old Empire planet of Earth. Five different races fled Earth's destruction and colonized this planet many parsecs away.

Residents of the planet long suspected they came from some other planet, but only recently were the remnants of the actual transport ship, Noah 2, located in a hidden underground complex. This discovery came at a good time for the planet of Arth. Their restored access to the stars became vital when their Sun suddenly became unstable and forced a mass search for possible locations for emigration of the planet's population to a safer environment.

You are one of the captains that Insterstel (Arth's space organization) has selected to located strange new worlds, seek out new life, boldly go.... oops, wrong game, but you get the idea. Since they don't know who is truly explorer material, they have started each captain out with only a basic ship hull and a small amount of capital and left it up to him to raise his own support.

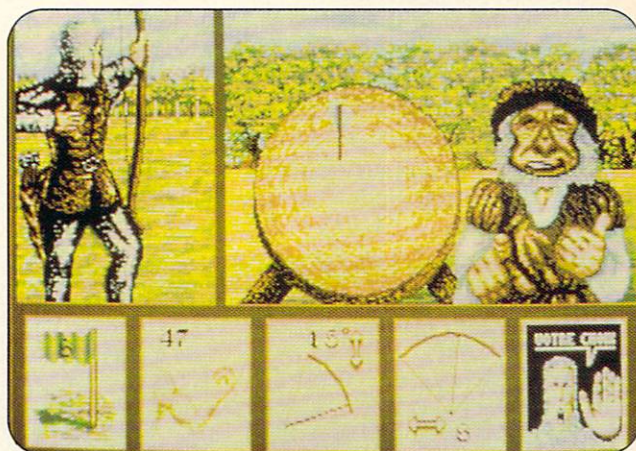
A crew must be hired and trained and the ship must be outfitted with the best the planet has to offer. Fortunately, several avenues are open to get the required funds. Mining, life-form hunting and even hunting for possible colonies can add to your treasury. You must be careful when picking possible colonies, however, since you will be fined heavily if you recommend a dud.

While the manual is unclear as to the ultimate goal, it seems to revolve around finding the source of your sun's instability and eliminating this threat to your civilization.

The graphics in the game are simply OK. They are a little better than a straight IBM EGA port, but not much. Cute sound sequences are included for each alien encounter and the sound effects during combat and exploration are appropriate for the task at hand.

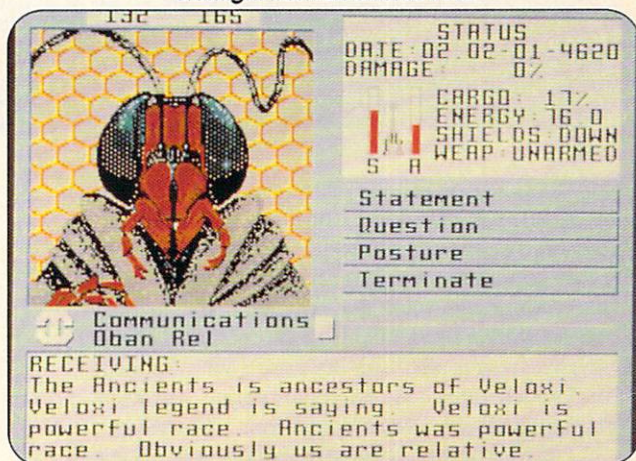
Control is rather clumsy, mostly due to the slow speed of the game. Actions such as landing your ship, driving your terrain vehicle, or even flying around interstellar space take a long time to perform. Because of this slow response, it is very easy to get a long line of actions queued up and have your ship keep moving, long after you wished it to stop. Either the mouse or the keyboard can be used, and using the mouse can avoid some of the queueing problems.

While I do not normally comment on copy protection schemes, this one is lousy. It uses a code wheel, which is fine by me, but the words around the edges are not put in any logical order and you must often scan the entire wheel to find the appropriate match. It would have been very easy to alphabetize the words, making finding their location much easier. Added to this is the fact that



Iron Lord from Electronic Arts.

Starflight from Electronic Arts.



the sequence is repeated each time you leave the starport. Since you are in and out of there many times early in game play, you spend much time looking up the proper code, time you should be playing. Why not simply do the check at game startup and not ask again?

Starflight is another space game that has missed its potential. While it is much better than games such as Star Command, the slow interface still get in the way and make play frustrating. I am still tempted to go back and try some more, but it is not really worth the effort. Count this one as a maybe.

ARTURA BY ARCADIA

Artura is a new arcade action game from Arcadia that adds some elements of strategy. Set in ancient Britain, you are cast in the role of Artura, the son of Pendragon. You must hack and slash your way through the minions of your evil half-sister Morgana to rescue Merdyn's beautiful apprentice, Nimue. Scattered throughout Morgana's stronghold are the pieces of the ancient ruins that will release the power to free Nimue and complete your quest.

Artura is a side view, "platform" game common in this genre. But each room is a distinct entity and the game features no scrolling. In fact, a map of the castle is included, though you are warned that the deeper levels may be a little bit wrong.

Many types of foes will hinder your quest. Ranging from human guards to common sewer rats, each requires varying numbers of hits to kill and will add a different amount to your score. One type is

to live. However, food is scattered throughout the castle and eating it will restore your health to the full level. Your health is also restored any time you gather all the pieces for any ruin.

Graphics are well done, and the animation is fairly smooth. An interesting feature is that fired axes with fly straight for a while, but then arc to the ground as they reach the end of their range, just as they would in real life. I did have a small problem with a line of video "fuzz" about a third of the way up the screen, but since this fell at the character's feet, it was easy to ignore.

The joystick is used for control during the game and works fairly well, though Artura has one flaw common in games of this type—once you begin a jump, you cannot change your direction until the jump is completed. This is one of the few games I have played that actually lets me use the autofire option on my joystick, though I found I could fire faster myself.

One nice feature of Artura is the inclusion of the locations of the food and ruin pieces in the manual for those who wish to play a purely arcade game. During most of my play I hung the map and used yellow stickers to mark where the food was and green stickers to mark the ruin pieces, making the game far more enjoyable for me. Even with this knowledge, it will take a while to master all the obstacles, gather all the ruin pieces, and accomplish your quest. A worthwhile purchase.

NUCLEAR WAR

Next is a unique adaptation of a popular card game (at least it was popular with me). New World Computing has finally expanded beyond dungeon themes with the release of Nuclear War, a game of global conflict. The game is a rather tongue in cheek treatment of this serious subject.

The game is solitaire and pits the player against four others intent on ruling the world. Each player chooses an action to perform the current turn on the diplomacy screen; then, the actions are played out in animation on a map of the five playing countries.

The diplomacy screen shows the player's currently-available weapon systems, the results of the last turn, and present attitudes of the various world leaders toward the player and each other. In the center of this screen is a close-up map of one player's countries, generally used for targeting a city for propaganda or missile attack. Animated sequences such as a silo preparing to launch, a bomber scrambling on the runway, or a finger pushing the button to drop a bomb are also shown in this area.

Several actions are available to the player. Dropping a bomb is done as a two step process: first a missile or bomber is launched, then a target and warhead are chosen on the next turn. While missiles are single shot, bombers can remain aloft until they drop a total megatonnage equal to their carrying capacity. Bombs run from the lowly 10 megaton warhead, to the mighty 100 megatons. The amount of people killed varies according the tonnage and a random effects modifier.

A player can also choose to build weapons during his turn, increasing his available stockpile for later. But since no one likes a stockpiler, it can be very dangerous to build twice in a row.

The more peaceful player can use propaganda of various sorts to try to entice an opponent's citizens to join your obviously superior society. But propaganda can backfire and some people may realize your hypocrisy and leave for your opponent's country. Various random occurrences may also occur. Some are good, such as a baby boom that increases your population, while others are bad, such as when a city spontaneously launches into orbit.

In case you didn't catch it, the goal is to be the only player with people and cities left. And the more of each, the higher your score. The



Artura throwing an axe at an enemy.

very reminiscent of the currently popular turtle ninjas seen in afternoon cartoons. Most will only damage you through direct contact, but when they touch you, they drain your health fast. But the far more dangerous ones not only send out magical attacks of their own, but also require may hits from your weapon to kill. You are armed with a special axe which fires out multiple copies of itself, damaging all creatures it comes into contact with.

If your health is completely drained away, you are dead and the game is over, you only have one life

winner gets to gloat on a devastated battlefield scene. But if everyone is destroyed, the entire Earth will be blown up and no one wins. Actually, you don't really win nuclear war, you just survive.

Computer opponents come in five different categories. Ronnie Raygun and Prime Minister Satcher are the two warmongers while Colonel Malomar Kadaffy and Ayatollah Kookamamie are very Chaotic and unpredictable. Tricky Dick and Mikhail Gorbachev are classed as Liars and are very hard to gauge. Ghanji and Jimi Farmer are pacifists and will try to win the world by peaceful means, though Jimi will use force if necessary. Infidel Kastro and Mao the Pun are the standard personalities and serve as the "control group". These various computer personalities add a nice bit of variety to the game and enhance play.

The graphics look sharp and the animations of various game actions are smoothly done. Sound is digitized and well integrated.

While, as a sticker on the cover warns, some may find this game objectionable, it is done in good fun and can make for an entertaining time, though the price may be a bit steep. It is interesting that Ghanji and Jimi Farmer will tend to get the highest scores. Perhaps peace does pay after all.

ALL DOGS GO TO HEAVEN

Finally, I want to briefly cover another movie licensing game from Merit Software. All Dogs Go To Heaven is based on the animated movie of the same name. You must guide Charlie, Ann Marie, and Itchy through the same encounters they have in the movie.

Ten different sequences make up the entire game. Some focus on arcade-like action while others are more strategy-oriented. Each can be played singly, or they can all be linked together in one long sequence. If they all are played in sequence, they are stuck in the middle of a kind of video comic book, in still frames showing the plot line of the movie and a textual description of what occurred. After all the intervening scenes are shown, the appropriate mini-game is played out.

The graphics are sharp cartoony. The soundtrack appears to be directly from the movie. Both are fairly limited, though; there is not nearly as much action here as say in Space Ace or Dragon's

Lair. Either the joystick or the keyboard can be used to control the action, but the joystick is preferable by far.

The game is not for the experienced player. The mini-games are far too limited to hold most players' attentions very long. Even the three



A closer look at a player's country from Nuclear War.

difficulty levels do not provide enough challenge. But the game might be good for younger players, a field with not that much competition. Some of the sequences may be a bit frustrating though, so a parent may want to keep an eye out for potential trouble.

The game recalls the limitations of the movie: not too stimulating for adults, but possibly fun for kids. If you are an older player, spend your money elsewhere. All Dogs Go To Heaven is worth considering for the youngsters, especially given its relatively bargain price.

•AC•

GAMES REVIEWED

Persian Gulf Inferno
Innerprise Software, Inc.
128 Cockeysville Rd
Hunt Valley, MD 21030
(301) 785-2266
Price: \$39.95
Inquiry #201

Iron Lord
UBI Soft
Electronic Arts Distribution
1810 Gateway Drive
San Mateo, CA 94404
(415) 571-7171
Price: \$39.95
Inquiry #202

Starflight
Electronic Arts
1810 Gateway Drive
San Mateo, CA 94404
(415) 571-7171
Price: \$49.95
Inquiry #203

Artura by Arcadia
Virgin Mastertronic International
18001 Cowan, Suites A & B
Irvine, CA 92714
(714) 833-8710
Price: \$39.95
Inquiry #204

Nuclear War
New World Computing
Electronic Arts Distribution
1810 Gateway Drive
San Mateo, CA 94404
(415) 571-7171
Price: \$49.95
Inquiry #205

All Dogs Go To Heaven
Merit Software
13635 Gamma Road
Dallas, TX 75244
(800) 238-4277
Price: \$29.95
Inquiry #206



Do It By Remote

Build an Amiga-operated remote controller for your home.

by André Théberge

This project is not for a first time builder. It involves a modification to a transmitter device which works on live AC voltage (117 V AC). Beside the potential voltage hazards present in the device, be aware that any modification to the transmitter will void its warranty and nullify the CSA or UL certification. The information given in this article, as well as the PCB service, is provided for entertainment only. Therefore, neither Amazing Computing nor the author are responsible for damage resulting from the above modification. Anyone attempting the modifications and procedures mentioned are doing so at their own risk.

The Amiga computer has always fascinated me because of its superior hardware design. At the time it was introduced, no computer could match its features for the price, which eventually led me into buying one to aid me in my personal hobby: electronic design. Since then, I have looked for new applications for my computer by building different electronic projects, which interface to the Amiga ports. The first one of these was an audio digitizer for the Amiga, which was covered in the May '89 issue of Amazing (AC V4.5). The public response to this article was overwhelming, so I decided to write another one to please all those hardware fanatics out there.

This article is about building a remote controller for your home using your Amiga as the command center. Building one of these will enable you to turn electrical appliances (TV, lights, stereo...) on or off with your computer, working as an intelligent timer or a sequencer. The project is based on the

popular "Plug 'n Power" family of controllers, available through your local Radio Shack store. The family features two models of transmitter devices and four types of receivers. The transmitter sends electronic tones through the electrical wiring of your house or apartment, which are picked up and decoded by the receiving units, in order to control any electrical appliance plugged into it. No special AC wiring is needed. One transmitter can control several receiving modules within the same house. By modifying an existing transmitter, we can interface it to the Amiga through the parallel port. We will use the Radio Shack catalog # 61-2677 transmitter for our project. Its low price (below \$15) and availability make it an ideal component. We will also have to build an interface for the Amiga. The whole project, not including the receiver modules, should cost around \$50; if you shop carefully, it might even be less.

HOW IT WORKS

As I mentioned before, we will use a Radio Shack Plug 'n Power (PnP) controller as our transmitting device. It is relatively inexpensive, and it will save us the headaches of designing our own circuit. (The idea behind this is: Do not attempt to reinvent the wheel.) Before we start building the project, I want you to be aware of the potential voltage hazards present inside the transmitter. This device is connected directly to the main AC line, without any transformer; therefore, some of the components have "live" voltage (117 Volts AC) on

their leads. Also, as you might already have guessed, this modification will void the warranty on your PnP controller.

The PnP controller circuit is encased in a beige plastic case. By removing 4 Phillips screws, we open the unit and find a membrane keyboard, a rotary switch, a 28 pin controller chip labelled "PICO", two tuning coils and a bunch of other components. A big capacitor is connected in series with the line, along with rectifier diodes, to produce a DC supply of about 18V. The controller chip is manufactured by General Instruments and controls keyboard scanning functions and pulse generation. The keyboard switches are directly connected to 10 pins on the PICO chip. Our goal here is to emulate the action of these mechanical switches with an electronic device called an analog switch. Putting an analog switch in parallel with a keyboard switch will duplicate the key's function; thus, it will let the Amiga take control of the unit. Analog switches are available as a single unit (CD4066 for example, 4 switches per IC), or can be arranged in a matrix inside an analog multiplexer. Since the keyboard is already arranged in a matrix (see Figure One), only two multiplexers (CD4051 and CD4529) are needed to emulate every key. These ICs are CMOS and will be powered from the transmitter.

Now that we have an electronic interface to the transmitter, we want to pass control to the Amiga. One problem still remains: the transmitter works on 18 Volts, with one side connected directly to the main AC line. IF THIS SHOULD COME IN DIRECT CONTACT WITH YOUR AMIGA, CHANCES ARE YOU COULD FRY YOUR COMPUTER OR GET A SERIOUS ELECTRICAL SHOCK. We must isolate the electrical signals of both units with a device called an opto-coupler. An opto-coupler consists essentially of a light emitting diode placed in front of an optical detector (usually a photo-transistor). A gap exists

between these two devices and acts as an isolator capable of withstanding high-voltages (2000 Volts typical). Electrical

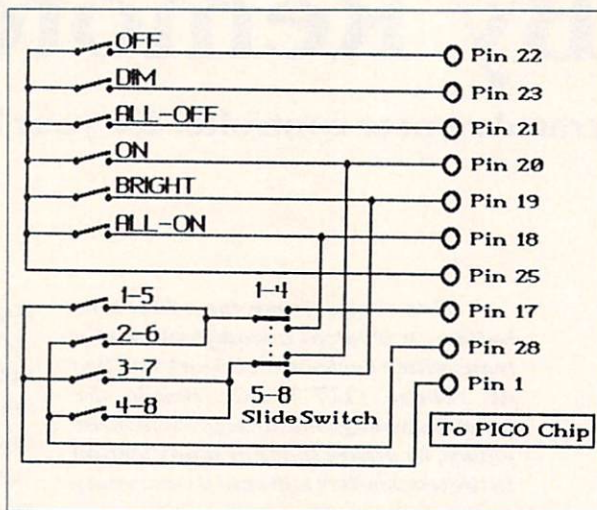


Figure One: Plug'n Power Keyboard Matrix

pulses on the LED generate light used to activate the photo-transistor, which acts like a light controlled switch. We are using five of these devices to interface the Amiga to the analog switches.

By looking at Figure Two, we get the full picture. U1 is a hex D flip-flop connected to the parallel port of the Amiga. Data lines D0 to D2 select one of the eight switches to be activated in the keyboard matrix. D6 enables the CD4529 multiplexer (U4) and selects the module to be active, replacing the bottom five switches on

Figure One. D7 enables U5 and controls the off/on, dim/bright and all-off/all-on functions. The common clear pin (#1 on U1) is connected to the Amiga reset line, thus putting all these flip-flops on a known state (inactive) during power-up. Outputs of U1 are inverted and buffered by U2 and drive opto-couplers O1 to O5. When no command is issued to the transmitter, all LED's in O1-O5 are off, thus minimizing power consumption. U4 and U5 emulates the keyboard matrix, as described before. U3 is used to select one of two multiplexers inside U4 and simplify decoding. U1 and U2 are powered from the Amiga parallel port while U3 to U5 use the PnP power supply taken off the PICO chip. Since this supply is around -18 volts relative to ground, the maximum absolute value for CMOS chips, we need to step it down to -12 volts by using V1, a negative voltage regulator.

MODIFYING THE TRANSMITTER UNIT

Before we get started on building the circuit in Figure Two, we still have to modify the Plug 'n Power transmitter unit. This step requires you to open the unit (thus voiding your warranty) to do a "Hack" job on the PCB. To be more precise, we will solder 12 wires directly on the pins of the PICO Chip. If you have not yet read the disclaimer, please do so.

Unplug the PnP transmitter and wait 10 seconds to discharge every capacitor in the unit. Open the case by removing the four bottom screws. Be careful not to drop any of the switch keytops or the red rotary switch. Locate the sliding switch element (that little beige plastic block with tin contacts seated below the keypad) and remove it from

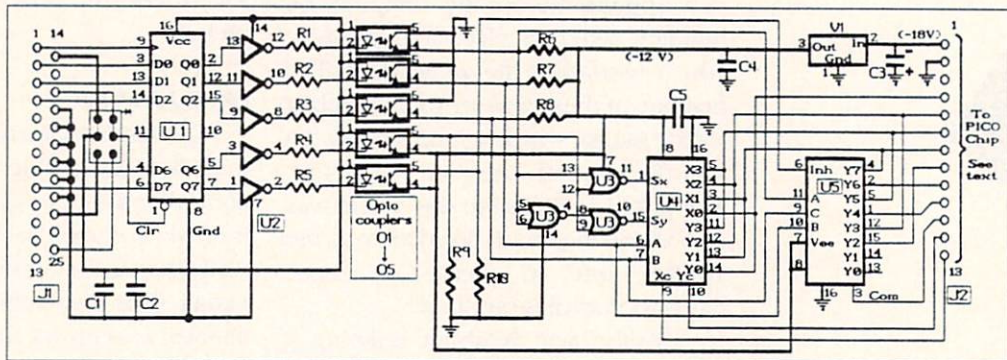


Figure Two: Schematic of the interface between the parallel port of the Amiga and the Plug'n Poser transmitter. Jumpers in the box labelled with an asterisk (*) are set for the A500/A2000 configuration.

the top part of the case. It will not be used anymore, so put it away. Locate the PICO chip on the PCB; it is the only IC and has 28 pins. Get an ohm meter and check for continuity between pin 14 of the PICO chip and one of the two AC prongs (those blades that you insert in the AC socket). One of them should give you a zero ohm

reading; mark it with a felt tip pen. For safety, ALWAYS plug the prong we identified to the neutral (white) side of the line socket. By convention, neutral is on the left of conventional 3-slot AC line sockets, with ground facing down. Doing this will prevent you from getting hazardous voltage while debugging the circuit.

With the unit still unplugged, get a 10 inch piece of flat cable (26 conductor) and separate each conductor on one end by about 1 inch long. Identify the red-marked conductor as wire #1, the one next to it as #2 and so on. With a cutter, remove every even numbered wire (#2, #4, #6 ...), along with wire #5. Strip away about 1/8" of insulation on the remaining wires and tin them using a fine tip soldering iron. Also apply solder on pins 1, 3, 14, 17, 18, 19, 20, 21, 22, 23, 25 and 28 of the PICO chip (component side). Now, following the wiring diagram in Table One A, connect each wire to its appropriate pin. Having solder on both the IC pins and the wires makes this slightly easier. When you have finished, inspect your work and make sure that no IC pins are shorted. Get a 26 pin double row flat cable connector (J3) and crimp it on the opposite end of the flat cable. You can use a small vise for this operation. Make a notch on the front of the transmitter case for the flat cable and close the unit. Do not forget to install the keytops and the rotary switch knob (the slide switch should NOT be installed at this time).

If your budget is limited, you can substitute the flat cable and connector with flexible wire and connect it directly to the main board. Use Table One B to get the wiring list.

BUILDING THE MAIN BOARD

Now is the time to plug in your trusted soldering iron and build the prototype.... Wait a minute, before you get your tools out, you have to decide if you

want to have a wire-wrap prototype or use a printed circuit board (PCB). While the first method has some advantages (you can start building right away if you happen to

leads or small gauge solid wire. Use quality sockets for every IC and put every component on top of the PCB. Be sure to check the polarity on C3 and the orientation of V1. When you finish your soldering job, check for any cold solder joint or solder bridges between tracks. Check closely around O1 to O5, J1 and J2.

You will need to build a small cable to connect the PCB to the Amiga parallel port. Get a dual row connector for flat cable (J4) and crimp it to an 18

inch piece of flat cable (26 conductor). Use a DB25 flat cable connector (J5) of the right gender (female for A1000, male for A500 and A2000) on the other end of the flat cable. Align pin 1 on both connectors and get rid of the 26th connector on the DB25 end.

TESTING THE UNIT

We will start by checking the supply voltage to the ICs. Please follow these instructions in sequence and make sure that you get a valid result before going to

the next step. You need to remove every IC on the board to do this test. Connect the J4 connector to J1 on the PCB. With your computer turned off, plug the DB25 connector (J5) into the parallel port of your Amiga. Do not connect anything on J2 yet. Turn on the power of your

computer to make sure it is operating normally. If not, turn it off immediately and check for a short between traces on the PCB or around J1. If everything appears to be normal, probe pins 8 and 16 of U1 and pins 7 and 14 of U2 with a voltmeter. You should read close to 5 Volts DC, within 20%. Next, get a pair of 9 Volt batteries and plug them in series to get an 18 Volt power

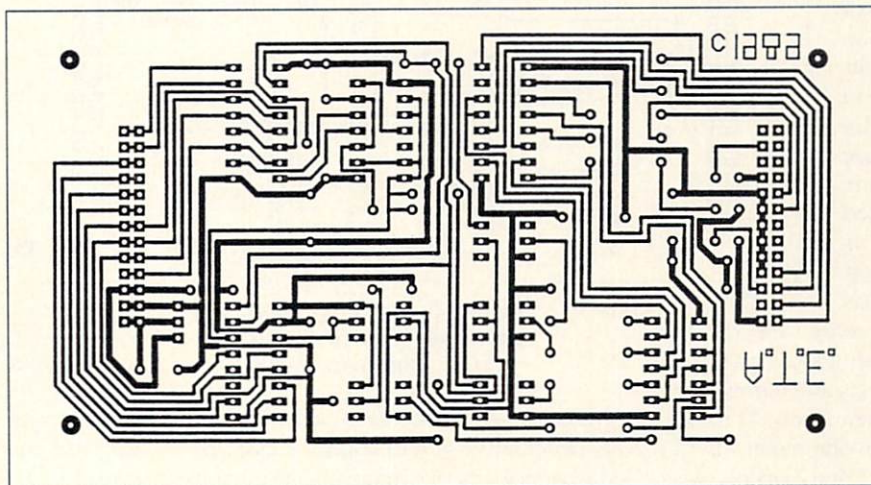


Figure Three: PCB layout (top view)

have all the parts on hand), it is more error-prone, which could be fatal to your computer if you make a mistake (like connecting isolated parts of the circuit). I strongly recommend a PCB, which you can make from the layout in Figure Three. If you don't have the tools to make one, I can provide the bare PCB along with some of the hard-to-find components (see the end of the article for more details). A PCB will

Table One A : Wiring list for flat cable

Flat cable wire # (see text)	Pin # on PICO chip
1 —————>	3
3 —————>	7
5 —————>	
7 —————>	17
9 —————>	18
11 —————>	19
13 —————>	20
15 —————>	21
17 —————>	22
19 —————>	23
21 —————>	25
23 —————>	28
25 —————>	1

Table One B : Wiring list for direct connection

Pin # on J2 connector (see text)	Pin # on PICO chip
1 —————>	3
2 —————>	7
3 —————>	
4 —————>	17
5 —————>	18
6 —————>	19
7 —————>	20
8 —————>	21
9 —————>	22
10 —————>	23
11 —————>	25
12 —————>	28
13 —————>	1

minimize the risk of errors while giving the project a more "professional" look.

Start building the board using the component placement guide as a reference (see Figures Four and Five). Select the right placement guide to go along with your computer (the difference between the two is the jumpers near J1). There are 12 jumpers on the board. You may use resistor

source. Connect the positive end of the stack of batteries to the (+) lead of C3. Connect the negative end to the metal tab of V1. I recommend alligator clips for this procedure. Now, check for 12 Volts DC between pins 7 and 14 of U3 and 8 and 16 of U4 and U5. Readings outside a 10% range indicate either that V1 is plugged in backwards, is defective, or that a short between power lines has occurred (or the batteries are dead). Chances are you will get good readings.

Turn off your Amiga and remove the temporary battery power. Insert O1 to O5 in their sockets. With an ohmmeter, check for continuity from pins 1 and 2 against pins 4 and 5 of each opto-coupler (O1-O5). You should get a very high resistance value (open circuit) for every reading, except between pins 1 and 2 or 4 and 5. If you get a low resistance reading, carefully check the PCB for solder bridges or shorts. A low resistance may also imply that an opto-coupler is defective. Again, it is normal to get a low reading between the LED pins (1 and 2) or the photo-transistor pins (4 and 5).

Now is the time to plug the ICs into their sockets. First, you have to get rid of static electricity in your body by touching the grounding screw of an AC outlet or a water pipe. Be careful not to bend any pins while inserting ICs. Connect J3 (coming from the PnP transmitter) to J2 on the PCB (PnP transmitter MUST BE UNPLUGGED while doing this...). Finally, check for the proper orientation of each IC and mating connector.

Now we are ready for the acid test. Make sure your computer is turned off and the batteries are disconnected (the batteries will no longer be needed). Put the PCB on a non-metallic surface with the components on the top. Make sure that any of the components or PCB tracks are not touching metal parts of other devices, especially your Amiga. Plug a PnP appliance module (Radio Shack catalog #

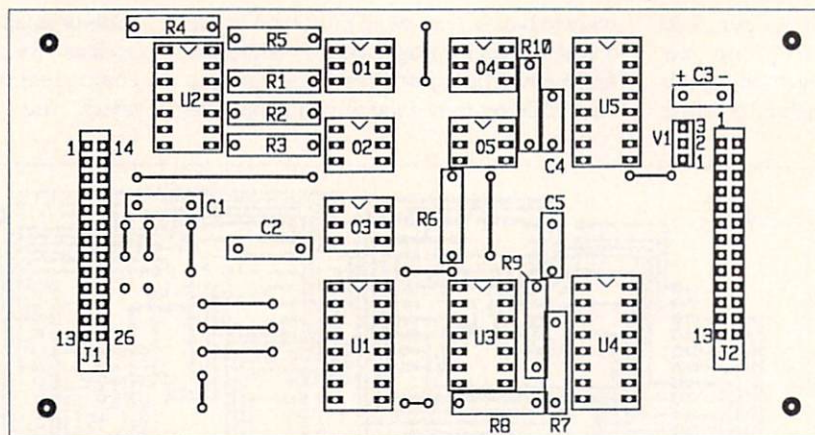


Figure Four: Component placement for an Amiga 500 or 2000 (top view)

61-2681, 61-2682 or 61-2684) into a nearby AC outlet and use it to control a lamp or equivalent AC device (remember to turn on the device before plugging it to the PnP remote module). Set up the channel number (red knob) on each PnP controller (transmitter and appliance) to the same letter (for example "A"). Set the unit number (black knob) on the appliance module to "1". Now plug the transmitter into an AC outlet. Be sure to watch for polarity by plugging the marked prong in neutral, as discussed earlier. Pressing any key (except number keys) on the transmitter unit should activate the LED, indicating proper operation of the unit. If

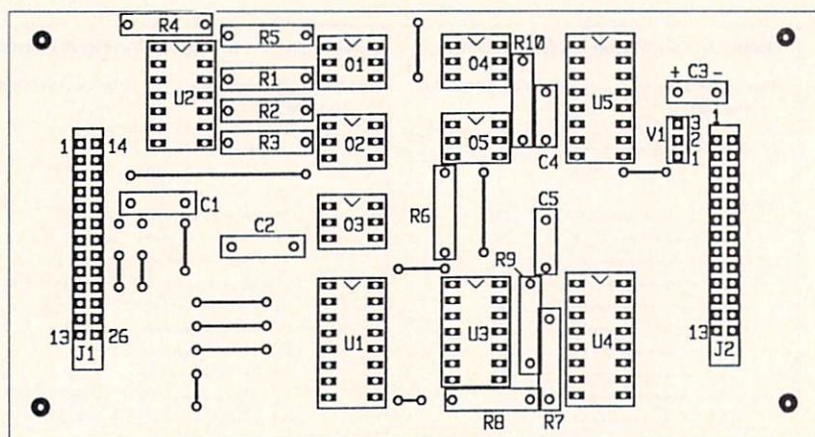


Figure Five: Component placement for an Amiga 1000 (top view)

you cannot get the LED to turn on, immediately disconnect the transmitter and check for wiring errors around J2. With the transmitter ON, you should get around 17 Volts across C3 and 12 Volts between pins 8 and 16 of U5.

If everything checked OK, you may now turn on your Amiga and boot AmigaBASIC. Type in Listing One and save it on a disk. Now run the program. At the prompt, type: "UNIT 1 ON" then press enter. The transmitter LED should flash twice and the lamp (or appliance) will be turned on. Typing "UNIT 1 OFF" will turn it off. If you just hear a click, flip the

switch on your appliance. By typing other unit numbers, you can control up to 7 other modules. Be sure that they all have different unit numbers. Other keywords like DIM and BRIGHT can also be used instead of ON and OFF. The program is straightforward; it can be understood by anyone who is familiar with BASIC programming. I have stayed away from Amiga style programming (windows, icons and gadgets) to keep it simple, because the program is only testing the hardware.

If you cannot get proper operation of the unit or flash the LED while issuing commands, you may have a problem with the software. Checking for typing errors would be the first step here; check every POKE statement and variable declarations. The next step would be to call subroutine

2000 with the ky variable set to 130, or to POKE this value in bas& (POKE bas&,130) to turn on the LED. If the LED still remains dark, check for wiring errors around U3, U4, U5 and J2. Remember to unplug the transmitter while handling the PCB.

When testing is complete, you might want to put the PCB in a suitable enclosure. I recommend an all-plastic case labelled as a utility box. I will let you

decide on the model, although I recommend Radio Shack catalog no. 270-224 because of its low cost and availability. Radio Shack catalog no. 270-223 can also be used; however, you have to trim the corners of the PC to make it fit inside. Always provide enough clearance for the flat cables and the mounting screws.

(continued on page 88)

AmiEXPO

March, 1990. AmiEXPO '90. Washington DC.

Let me say just one word and then we'll be on with it. Plastics. Now let me say one more word, this one

perhaps more relevant to the situation. Joggers. I mean, this place was teeming with joggers. Why, just en route from the airport to the hotel, we must have left for seriously injured 5 or 6 of these fitness fiends. And our taxi driver's prey o' the day was clearly listed as being small towheaded children with pronounced overbites. Lobby for better representation? You'd do better to boycott Nike.

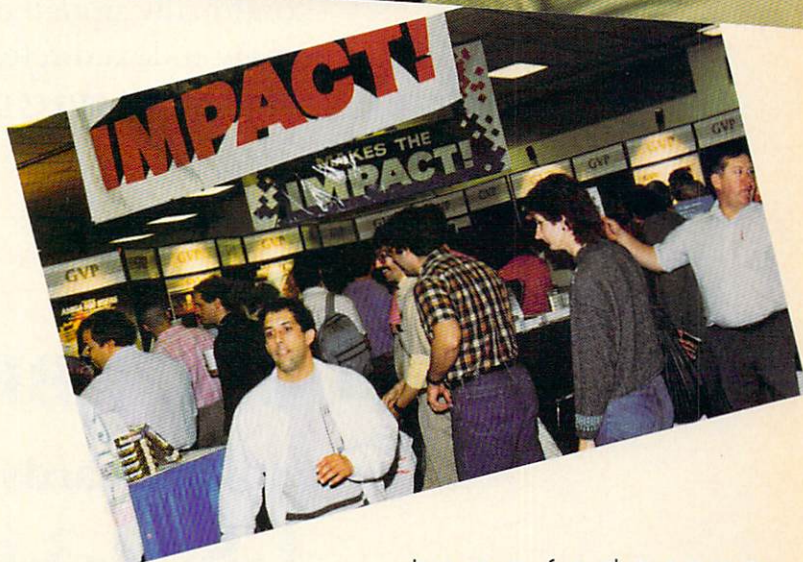
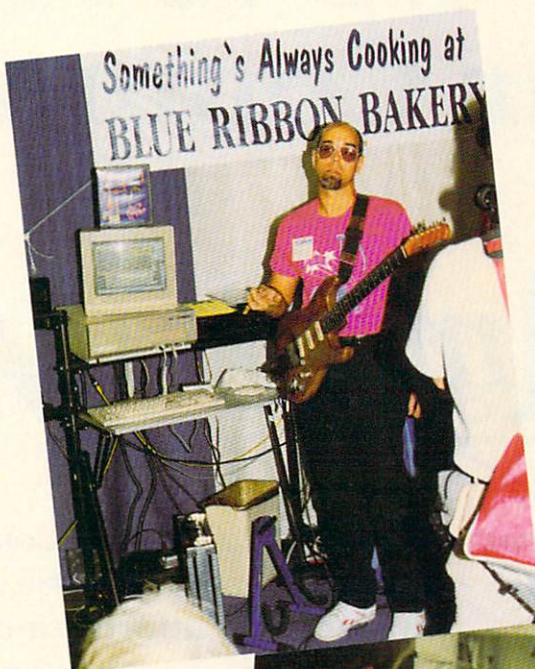
In any event-AmiEXPO '90 Washington. Many people, many booths, many blossoms. Oh, that's another thing. The cherry blossoms were early this year. Specifically, they peaked on March 16, the opening day of the show. Kind of a disappointment for someone like me who traditionally likes to experience this great American observance vicariously through network television and the commentary of Tom Brokaw.

But back to the show. Bouncing about the show-room floor, word of many exciting new advances, provided through dutiful booth staffers, diligent PR folk, or very privately held demonstrations, assaulted the ear. Combine these tidbits with the announcement of the formation of the Amiga Developers Association (ADA), as well as insight provided through speeches and seminars held, and you are presented with what appears to be an effort determined to mature and move beyond.

Among the new Amiga product announcements that caused a stir at AmiEXPO Washington, **Progressive Peripherals & Software's** soon-to-be-released "3-D Professional" boasts, among other things, an intuitive, powerful interface, ARexx support, as well as support for overscan and all resolutions including HAM. 3-D Professional will sport up to 99 colored light sources of varying intensities and types, easy-to-use ANIM creation facilities, support for a number of object file formats including Sculpt 3-D, Turbo Silver, and VideoScape 3-D, and full surface attribute control including built-in textures like marble, wood, and rippled.

Though they did not officially exhibit, **Gold Disk** held private showings of their new multimedia presentation generator, "Showmaker", to be released this month. Promising to be the layperson's ticket to everything from "Bullwinkle" to "Wheel of Fortune" to "MTV", the package will allow anyone (that's right, anyone) plan and construct presentations or "shows" by incorporating internally or externally produced text, images, computer graphics, animation, music, video, and audio. In addition to allowing you to communicate with any

(continued)



by e.g. fedorzyn

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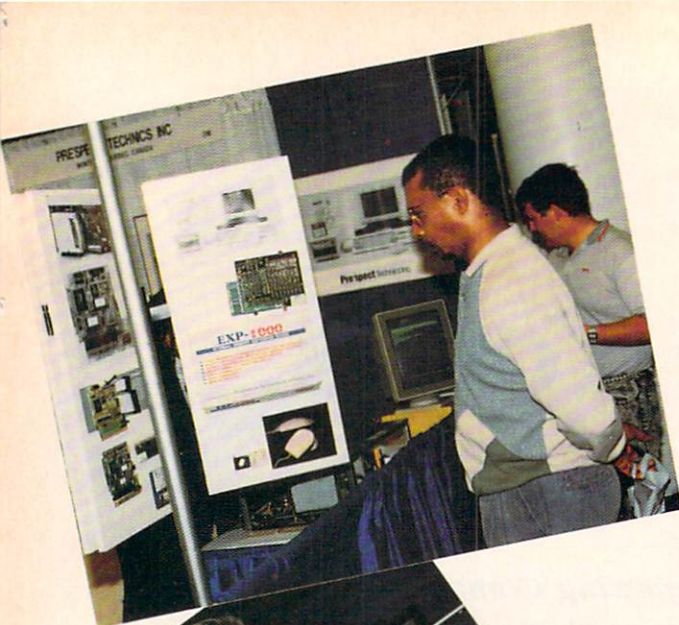
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external device, Showmaker will also preview and print storyboards and/or cue sheets of your presentations. And, since the program lets you play and simultaneously load data from your hard disk, presentations created with Showmaker can be much longer than presentations that simply run off memory. So for all of you out there with that killer idea for a made-for-TV movie, now might be the time to contact Valerie Bertinelli. In other Gold Disk news, the company is now shipping "Outline Fonts", a collection of over 35 professional, resizable Compugraphic outline fonts for use in Amiga desktop publishing, video titling, and word processing. And "Professional Draw Version 2.0" will soon be released, touting, among other things, a five-fold speed increase over previous releases.

Mike Halvorson of **Impulse, Inc.** wooed showgoers with word of the upcoming release of "Imagine", the company's new professional 3-D object creation, animation, and rendering package. To be made available May 31, Imagine will reportedly pick up where Turbo Silver left off.

With their brand spankin' new display (oooo—the company checkbook must still be reeling), **Digital Creations** made quite an impressive showing at AmiEXPO. Their "DCTV" (Digital Composite Television) was the main attraction, with its ability to digitize video images and convert IFF images into DCTV graphics for display or manipulation. Through a revolutionary process of video compression, the system takes the digital video signal that comes from the Amiga RGB port and converts it into full color composite video. Among its many abilities, DCTV allows you to display full color video images with millions of colors, capture a video frame in 10 seconds from any color video camera, and animate in full NTSC color.

As always, the **Great Valley Products** booth was well attended as company representatives demonstrated some of the latest GVP products including their "Impact A4000 Plus 1 Accelerator Board".

Representatives of **Applied Engineering** made their rounds at the show. A new entry in the Amiga hardware peripheral market, Applied Engineering's initial

product releases include the market's first high-density 3.5 external disk drive; an external 2400 bps modem with optional MNP-5 and send-fax capability; an internal 2400 bps modem with optional MNP-5 and send-fax capability for the 2000 series; and a memory/clock card for the 500.

Jim Bayless and Brian Sarrizan of **New Horizons Software** were busy demonstrating the latest version of their graphic word processor, "ProWrite 3.0". The major upgrade features multi-column support, ARexx support, and the ability to keep up with even the most proficient of typists (!).

And speaking of quick typing, the folks over at the **Micro-Systems Software** booth had word of a revamped "excellence!" in the works (no pun intended) that will reportedly wait for no typist.

Computeral Services promoted their new PostScript to 3D Translation software tool, "AutoScript". The program allows you to create animations easily by letting you import point-accurate PostScript drawing files into Sculpt 4D or Turbo Silver. (No more redrawing!)

Over at the **Xetec** booth, showgoers found exhibited a host of FastTrak hard drive systems and tape back-up systems, including the new FastCard Plus SCSI controller w/RAM for the A2000, FastTape back-up systems, and the Mini FastCard economical SCSI interface for the A2000.

There was some serious jamming going on over at the **Blue Ribbon Bakery** booth. During Saturday's show, The Melvin Sparks Blues Band performed and provided musical insight in an exhibit centered around the Bakery's "Bars & Pipes". Musician Michael Torres took the stage on Sunday to demonstrate the capabilities of the popular BRB music package.

In a different sort of performance, **Hologramophone Research** demonstrated their latest programs "Pixound" and "Hyperchord". Pixound is a unique musical program that translates visual art into music, while Hyperchord works as a dynamic riff sequencer.

In addition to the announcement that they will now be publishing "M", **Dr. T's Music Software** provided attendees with info on their many music packages including the "Keyboard Controlled Sequencer 3.0", "Tigercub", and "The Copyist".

Scott Bennett of **Expert Services** was on hand to answer questions regarding his company's latest offering. Expert Services will now be distributing Greg Tibbs' "A1000 Rejuvenator Expansion Board", which basically provides A1000's with many of the features of a A2000 or A500.

Curtis W. Wray of **Advanced Creations Incorporated** traveled the showroom floor disclosing news of his company's new software package, "The Engineer's Toolbox", a collection of incremental software to support the entire computing realm of the scientist or engineer. Current and future volumes of The Engineer's Toolbox include Graphing Tools, Numerical Analysis Tools, Statistical Analysis Tools, and various Power Tools (Aerodynamics, Control Systems, Cartographic Applications, etc.).

The **Electronic Zoo**, a newly formed entertainment software company established by former MicroProse vice presidents Richard Todd, Steven Meyer and Stewart Bell, exhibited the Zoo's first two releases, "The Legend Of William Tell", and "Treasure Trap". In June, Electronic Zoo will release "Xiphos", a 3D flight simulation and strategic adventure that has you pitted against Xiphos, and all-powerful artificial intelligence run amok (not the ol' all-powerful-artificial-intelligence-run-amok bit again!).

Around the corner from the Zoo, **Free Spirit Software's** Barney Bear was busy attracting young'uns and parents alike. As the star of Free Spirit's new interactive educational program entitled "Barney Bear Goes To School", Barney Bear takes children from the morning wake up call all the way down to the little red school house, where he walks children through a regiment that includes the alphabet, numbers, shapes, and colors. Being the buddy that he is, Barney Bear also instructs on, among other things, good dietary habits. Should a child, for example,

select the cookie jar while seated at the breakfast table, the program will respond: "Don't be silly. Little bears can't have cookies for breakfast". Little bears don't usually participate in the public school system either, but hey, who am I to squelch a bear's spirit with societal supposition? Other Free Spirit packages exhibited at the show include their latest game, "Dragonscape", as well "Doctor Ami", a new memory and hard drive diagnostic utility that should be shipping by the time you read this.

Joe's First Company made its first appearance at a US AmiEXPO. President Joseph Rubenstein displayed his "Pic-Magic" series of clip art packages. Included was the original package, along with Package 2, a collection of Fantasy/Medieval images, and Package 3, a collection of Wedding/Couples images (happily, the clip art has a much higher success rate than the institution). Upcoming clip-art packages from Joe's First Company will feature Package 4: Business Graphics and Package 5: More Fantasy Images.

"MyPaint", "QuasarSound", "D.U.D.E.", and "World Atlas" were just some of the programs displayed at the **Centaur Software** booth.

As always, some of the most expansive booths were occupied by Amiga product dealers. With cash in one hand and checkbook in the other, attendees hungry for the latest in Amiga software and hardware rushed the booths of companies such as **Comp-U-Save** and **Creative Computers**.

Of course, AmiEXPO Washington was not just a group of folks pushing their products. There were also hotel personnel pushing outrageously overpriced fruit cups and hot dogs.

But truly, as always there was a plethora of information to be acquired both on and off the show floor. Master classes were held on a variety of Amiga disciplines. Oran Sands 3.0 headed "The Amiga In Pro Video", Jim Sachs was on hand to instruct on "The Art Of Amiga Art", and Steve Segal provided his expertise for "Amiga Art In Motion".



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Other Master Classes held included "Working With Amiga C", "3D Designs And Models", and "To Publish, Amiga Style". Seminars included "The Amiga and Animation", "Amiga Hardware Expansion", "Amiga Graphics", "Desktop Publishing On The Amiga", "Amiga Video", "MultiMedia And The Amiga", and "Amiga Music".

Keynote speeches delivered by Steve Robbins, Gail Wellington, and Jay Miner helped to, among

other things, set the stage for the promotion of the Amiga as a truly singular machine.

Amazing Computing collected and issued a check for \$500.00 to the Washington DC branch of the American Cancer Society.

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R O O M E R S

by The Bandito

[The statements and projections presented in "Roomers" are rumors in the purest sense. The bits of information are gathered by a third party source from whispers inside the industry. At press time, they remain unconfirmed and are printed for entertainment value only. Accordingly, the staff and associates of Amazing Computing™ cannot be held responsible for the reports made in this column.]

THE TOASTER POPS UP

The Bandito's informers often undergo great personal risks in obtaining data for the Bandito's Roomer Mill. The latest casualty is an informant who was haunting Topeka in an effort to find out just what those crazy NewTek guys are up to. They've been awfully quiet lately. Well, the Bandito's informant joined the Cool Friends of NewTek in a brave infiltration effort, but it seems to have strangely effected his mentality. The Bandito's informer has been babbling about desktop fusion and antigravity, so he's been confined to a small upholstered apartment where he watches old Mr. Wizard reruns. However, he did gather some interesting tidbits before becoming incoherent (he now speaks only in Assembler language).

The claim is that the Video Toaster will be shipping soon, with initial versions going to carefully chosen beta testers. It may even be out by the time you read this. The ace magicians Penn & Teller agreed to do a promotional video for the Video Toaster, which was the impetus that put the final finishing touches on the Video Toaster (the Toaster had to be finished for the video). Large quantities of the Video Toaster should be available in the summertime.

The Penn & Teller video features a 30 second lead-in of incredible computer graphics created by Allen Hastings and his 3D animation product for NewTek. The quality is said to look just like the best stuff you see on TV. The Bandito hears that Allen's product will be out by the fall, and NewTek may be producing a frame buffer to go with it to produce those high-quality images.

The list of Toaster features has gone far beyond those already published, according to what the Bandito hears. A full demonstration of the Video Toaster is planned for the National Association of Broadcaster's show in Las Vegas. The Bandito will attempt to bring you a full report on all the interesting Amiga happenings (including the Toaster) after the show.

WEIRD STUFF DEPT.

The Bandito's spies have seen an Amiga 2000 stuffed in a tower case, created by a developer with the unlikely monicker of Daniel Ten Ton. Fairly easy to do, according to him, if you're handy with a screwdriver and know your way around a pc board. Will Commodore ever make such a model? Maybe for the Amiga 4000...

SPYING ON COMMODORE DEPT.

The latest wrinkle in the Bandito's fabric of speculation concerning Commodore's attempts to get Big Name Software: The Westchester Whizkids are trying to get Excel for the Amiga by telling Microsoft that Lotus is doing 1-2-3 Amiga, while they're wooing Lotus by saying that Microsoft is interested in doing Excel Amiga. Could this ancient sucker play still work in this modern, high-tech era? Stay synthesized to this channel to find out.

So Commodore is still wooing Lotus to get 1-2-3 on the Amiga. As if a business

is going to buy an Amiga if they need to run 1-2-3. Wise up! You have to find applications that the Amiga can do better than any other computer — better yet, that no other computer can do — if you want to sell Amigas. And then you have to make sure you keep advancing the hardware so that other computer companies don't add in all *your* unique features to *their* computers. In the next year or so, new computers from both IBM and Apple will have graphics coprocessors built-in, true multitasking, high quality audio, and high quality graphics. The performance gap is starting to narrow. The Bandito hopes that the Amiga 3000 ups the ante somewhat, and that some of the other items lurking in dark corners of the Westchester laboratory find their way to the marketplace.

The 3000 has been making the rounds of developers to rave reviews, and dozens were on display at the European DevCon. The features list, as near as the Bandito could deduce at press time: a 68030 running at 25MHz with a RAM cache on the motherboard and 2 Meg of RAM (and a new chip set that handles 2 Meg of CHIP RAM), a 60 megabyte fast hard drive, full 32-bit bus (Zorro III) and memory, all contained in a four-slot case that's smaller than an A2000. Supposedly, the new bus is backwards compatible with the current Zorro II bus. The CPU is run asynchronously from the bus allowing the CPU to run at top speed out of its cache memory at the same time as the custom chips do their jobs.

The new 1.4 software and the Enhanced Chip Set along with the asynchronous CPU allow a virtual screen size of 1280x485 pixels without interlace. When the new ECS and 1.4 actually make it to market, a chip upgrade will be offered for the new Denise (or the entire chip set if you haven't got a Fat Agnus already). The



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price is expected to be in the \$150 range for the new Denise.

One thing that Amiga owners should keep in mind about the new graphics modes offered by the enhanced Denise chip—if you want the non-interlaced hi-res display (640 x 480), you'll have to have a multi-sync monitor. And they aren't cheap. Figure on spending at least \$500 at the low end, and \$600 or more for a good name brand like Sony or NEC. On the other hand, Commodore may offer a monitor that can handle the job for around \$400 or less, but without the capability of the more expensive monitors to handle all sorts of different computers and resolutions. And of course the dot pitch and other subtleties of the monitor won't be as nice, but that's the trade-off you make for price. Picky people have to spend more. The Bandito is looking forward to flicker-free hi-res, but MicroWay isn't. Do they have something waiting in the wings that can sell like the flickerFixer?

The Bandito hopes the A3000 will be available when announced, otherwise we might see a falloff in A2500 sales while buyers wait for the A3000. We'll see.

Insiders say they really like the styling of the A3000 case, which among other things puts the power switch in front (the logical spot) and the keyboard connector on the side. The A2000 case always reminded the Bandito of a Swedish car—built to withstand 30 mph head-on crashes, with all the flair and sexiness of a Soviet tank. This new A3000 case may be the start of a new look for the Amiga, with a graphic artist redesigning the Workbench look as well.

Plans are already under way in Westchester for a 68040 card that can be dropped into the A3000, when the chip becomes more available. Later on, the 68040 will be standard in higher-end Amigas. The chip reportedly hums along at 50 MHz, which means that you can expect at least a doubling in speed over the 68030. Of course, this won't be cheap. You will not only have to pay a lot for the chip, you'll have to spend some money to fireproof your desktop so it won't get scorchmarks.

With all these vast changes happening on the high end of the product line, what about the rest of us who buy the lower-priced stuff? We can look forward to

further price reductions on the A500 and the A2000 later this year. It's unlikely that we'll see the minimum configuration increased to 1 megabyte of memory or a faster 68000 any time soon; it's more important for Commodore to get the price of the A500 down to really start moving them. The Bandito figures it's gonna happen right before Christmas.

The Bandito hears that Commodore has another Bridgeboard prototype in the works, this time with a 20 MHz 80386. They're thinking about having it ready to drop into the A3000 later in the year, creating an awesome multi-processor platform. It's particularly important to the federal market, where MS-DOS compatibility is on the checklist. With the Bridgeboard design, you can write programs to take advantage of both processors for some incredible speed, which is attractive to the scientific computing market. Commodore continues to have its eye on the higher-end markets, so expect them to be including features important to users in those markets.

It's not by chance that the A3000 debut coincides with the release of a new version of UNIX. Amiga UNIX (Amix) is the key to selling the A3000 to many different accounts that Commodore can't reach now. That's why UNIX is important—because certain government contracts require it, not because ordinary users want it.

The latest Amiga 1000 trade-in program was very successful. The Bandito hears that it was motivated by a shortage of A1000 repair parts. This way, Commodore not only reduces the number of A1000's out there, but they get a fresh supply of parts to handle the needs of the die-hard A1000 fans. Of course, retailers and developers love it, too—they no longer have to worry about supporting the A1000. The Bandito thinks that the upgrade program has been well handled, and it's far more than most computer companies offer their customers.

Commodore may benefit from the Apple layoffs, by hiring a few of the riper fruit that fell to the ground. While many of the positions in the new Commodore structure have been filled, there are still a few spots open. The task now facing Commodore management is to get all of these new employees and new operations working at full efficiency. The bottom line: sell more Amigas.

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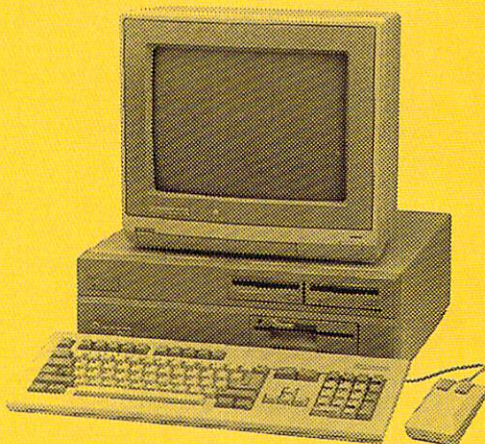
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games in from Europe. Their latest import is *Hound of Shadow*, a horror game. The other new title doing well for them is *Swords of Twilight*, a roleplaying game that allows up to four players. Data East has a hot new title in the stores imported from France, called *Drakkhen*. It's a roleplaying game with a 3D view and some sharp graphics. But the Bandito's favorite is *Nuke War* from New World Computing. Nothing like blowing someone up to make you feel good, especially when it happens with neat Amiga graphics.

While we're talking about games, the Bandito has a few pet peeves. For instance, many foreign games only recognize one disk drive. It doesn't matter if you have two drives hooked up; you still have to swap disks. Hard drive? What's that? Someone ought to wise up those folks across the water. Send 'em an extra disk drive or something. How hard can it be to look for another disk drive? Well, that's not all that bugs the Bandito about the imports. How about manuals that read like they're still in German although they're in English? Sometimes they even tell you how to play the game, but not always.

Perhaps with all the changes in Eastern Europe we'll see Rumanian games, Czechoslovakian games, and even East German games.

NEW STUFF DEPT.

ReadySoft is said to be releasing version 2.0 of their AMAX Macintosh emulator this spring. New features are said to include support for hard disk drives (various controllers, including Commodore and GVP), supporting the latest Apple system software, and greater support for sound. File transfer improvements may also be included.

CD OR NOT CD?

Things are getting exciting in the world of CD-ROM. As you know if you've listened to the Bandito before, the original design for a mass-market CD-ROM machine was dubbed CD-I or Compact Disc Interactive. This machine was designed by Phillips; it's basically a computer with a CD player, designed to be a consumer product. Unfortunately, the advent of other technologies and much infighting over specs has delayed the introduction (it was originally supposed to be 1987). Though many have given it up for dead, CD-I is alive and kicking. After painful years of argument and bickering, the standard is finally set and the manufacturers are committed to introducing the product next year.

What distinguishes CD-I from a personal computer is the fact that it's being handled like a consumer product. The spec is being published, and anybody can manufacture one (just like VCRs or CD players). So in the summer of 1991, Sony, Phillips, Sanyo, Panasonic, Toshiba, JVC, and Yamaha will all be introducing compatible CD-I machines for under \$1000. This kind of hardware support gives rise to software developers that are much more interested in creating software for the machines. Oh, and the price of CD-I players should drop as production builds, so that they'll be around \$200 in three or four years.

So what does it do? Here's the hardware specs, fresh from the promotional tour that CD-I is making among software developers:

CD-I is built around a 10MHz 68000 and a CD-ROM drive (600 megabyte capacity) with 1 Meg of RAM (possibly 1.5 megabytes) and 8K of battery backed-up RAM (which can be used for saving games or other data). There are special chips that handle audio and video decompression to provide some truly amazing results. Of course, you can play a standard CD in a CD-I player, but you can also get many different levels of sound quality depending on how much space you want to use up on the disc. You can get up to 24 hours worth of AM radio quality sound on one disc.

The weird part is that CD-I runs OS/9 as its operating system—a multitasking operating system only familiar to old Tandy customers. But the video output is great: 2 384x240 playfields, using a dual playfield mode like the Amiga. The color palette is adjustable, depending on how much overhead you want to incur, but the best is 256 colors out of 16 million. There's 1 16x16x1 sprite, designed to be the pointer or cursor; 1 600Meg CD player (also plays audio CDs) and stereo audio channels. The spec calls for one Input Device that has two buttons; it can be either a mouse, trackball, joystick or touch screen.

Basically, you can have a full motion video background (one playfield) with one or two playfields on top of it (kind of like a genlock effect), using the 384x240 (i.e., overscan) resolution, and a fourth playfield that is the cursor. The two 384x240 playfields can be dissolved one into the other, or treated as a sprite, or many other effects. Hardware scrolling is available for each playfield.

Up to 72 minutes of full motion video (heavily compressed, of course) can be stored on one CD. The quality is not bad; it looks about like that HAM movie NewTek was showing at conventions (Demo Reel 2,

they called it). All of this data can be read off the CD in real-time, so you really can have interactive movies.

But the Bandito is willing to bet that the first titles to hit for it will be quickie adaptations of existing software. To actually take full advantage of the new hardware will take years, just as it has always taken for new computers. Compare the first Amiga games to the latest Amiga games, or the original paint software to what's out there now to see what can be done with a few years' practice.

What does this have to do with the Amiga, you ask? Well, the specs sound very similar to the Amiga plus CD-ROM player the Bandito told you about before. They should appear about the same time, too. Performance will be similar. But the Amiga has the advantage of a huge software base, and also more traditional computer appurtenances like a keyboard, disk drives, printers, etc. And the Amiga should be cheaper than the CD-I player, since the Amiga chips are already in mass production. It's shaping up to be an interesting battle in the marketplace. The Amiga has the initial software, hardware, and price advantage, but it's up against some heavy competition. Hey! The Bandito has an idea. Just sell the Amiga spec to anybody who wants it and let anybody make Amigas, just like CD-I players. Fight fire with fire, eh? But it's too innovative an idea. It will never happen.

Cinemaware already has a CD-I version of *It Came From The Desert* in production, at a cost rumored to be in the millions. We're talking full movie-style sets and filming! Other game manufacturers are lining up to produce titles for both systems. So we'll expect to see some great graphics and sound along with our games. But will the games get any better? The Bandito hopes so. It would be a shame to waste all that neat hardware on another version of Breakout or Space Invaders. New technology demands better than old titles warmed over and served up with new graphics. (Remember the very first Amigas that were ugly ports of C64 products? They died the quick death they deserved.)

What about other machines? Well, the latest word is that IBM's machine is now delayed till at least Christmas. It was not announced as expected at the Microsoft CD-ROM Conference, so it looks like it will be later than hoped for (and more expensive, too). The ever-active rumor mill says that Fujitsu may bring their FM Towns PC with CD-ROM to the U.S. to fill in the gap, offering a version of it priced at under \$2,000.

•AC•

S U P E R B I T M A P S

in amigabasic

The creation of a superbitmap to hold a graphics display larger than the monitor screen is now possible using the AmigaBASIC routines presented in this article. A demo program is presented, along with a second program containing the routines that can be merged and simply called from your own AmigaBASIC programs. I have converted the C-language techniques for superbitmaps into AmigaBASIC PEEKS, POKES, and CALLS to ROM Kernel routines.

The following material explains how to create a superbitmap, how it functions, and how to set the parameters needed to define your display. Since the window can only display a limited portion of a large superbitmap at any one time, I will show how to scroll the window around inside the superbitmap. Since these are not standard BASIC windows and bitmaps, I have included graphics and text routines to draw onto them.

USING THE PROGRAMS

At this time, you may be eager to see what a superbitmap can do. First, you must prepare the four .bmap files needed to run the program. They include:

```
exec.bmap  
intuition.bmap  
graphics.bmap  
layers.bmap
```

If you need copies of these files, they are located in .fd format in the FD drawer on the Amiga Extras disk. To convert them into .bmap files, use the ConvertFD program in the BASIC Demos drawer.

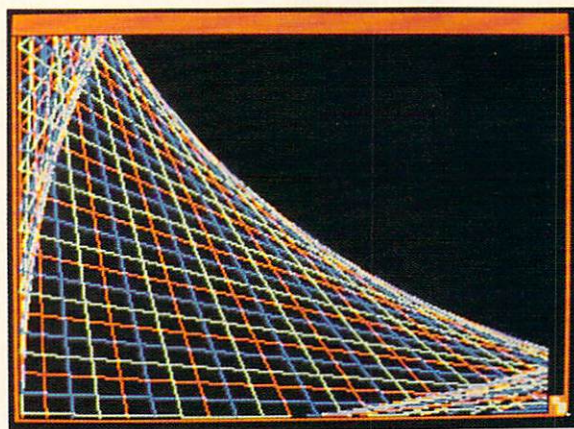
Now, type in Listing One and save it as an ASCII text file. You can do this by typing the following statement into the AmigaBASIC output window:

```
SAVE "super_bitmap_functions", a
```

After you have saved the file, select NEW from the PROJECT menu to clear the LIST window. Now type in Listing Two and enter the following statement into the AmigaBASIC output window:

```
SAVE "super_bitmap_demo", a
```

After both programs are saved, merge Listing One onto the end of Listing Two. This is accomplished with the following statement:



Portion of superbitmap demo captured.

```
MERGE "super_bitmap_functions"
```

Soon the disk drives will stop and you should have the complete listing for the demo. Save the program now! Before you start the program you must make four line changes in Listing One. These will notify BASIC of where to find the .bmap files you prepared earlier. Change the LIBRARY commands to specify which directory (or directories) the .bmaps are in. For example, if you saved your .bmaps in a directory called "df1:bmaps," then change the LIBRARY commands

by Jason Cahill

from LIBRARY "exec.bmap" to LIBRARY "df1:bmaps/exec.bmap." This change must be present for the program to run. Also note: the directory change in the LIBRARY commands will work for any disk or drawer that you have.

When you are ready to start the program, select RUN from the START menu.

MAKING YOUR OWN PROGRAMS

The routines in Listing One are set up so that all you do is insert several statements and four function calls to load the libraries and open, scroll and close your superbitmap. You should always place the following line near the top of your program:

```
GOSUB Super.Bitmap.Libraries
```

Next, in the main body of your program CALL SUPER.BITMAP(), with the first parameter set to "open." If successful, this will open the superbitmap and allow you to use it for your needs. Somewhere after the previous call, you may wish to scroll the superbitmap around. This is accomplished with the SCROLL.SUPER routine.

When your program is finished using the superbitmap, CALL SUPER.BITMAP() with the first parameter set to "close."

Most of the remainder of this article describes how the routines actually build up the superbitmap. Please note that the routines in Listing One handle all the setup work for you. No additional programming is required to make these functions run. If you are only interested in how you can call the routines, jump ahead to the section labeled *CALLING THE ROUTINES*, which includes a complete discussion of the above functions.

REFRESH MODES

This section contains some background information on how a superbitmap gets redisplayed. This section may be ignored entirely, unless you are interested in how the process works.

A refresh mode is the way that Intuition, the operating system, redraws a specific window. Each window has its own refresh mode to which Intuition responds.

Intuition supports the following three refresh modes:

SIMPLE REFRESH: This is the name of the standard redraw mode that BASIC supplies. A simple refresh window is one that loses its contents whenever it is resized or is covered by another window.

SMART REFRESH: This mode, specified by adding 16 to the type parameter in BASIC's WINDOW statement, preserves its contents after being resized or covered.

SUPERBITMAP: This mode is not readily supported by BASIC. This is because a superbitmap requires its own bitmap to redraw the window with. That is, what you see in the window is simply a copy of the original. Therefore, when you wish to see a different piece of the larger bitmap, Intuition copies the appropriate part.

BITMAP ARRAY

A bitmap array is a set of addresses that indicate where a segment of displayable memory (bitmap)—which contains all the text and graphics for a

specific window—is located. The number of addresses required for the bitmap is determined by the depth of the screen it resides on. The bitmap array also contains other variables, such as width, height, depth, and special flags.

In the special window refresh mode called SUPERBITMAP, a bitmap is prepared which is larger than its associated window. The bitmap can be sized up to a width and height of 1024 pixels. The minimum size is equal to that of its associated window plus one.

The memory for the bitmap must be in the first 512K RAM (CHIP RAM) of your Amiga. This is because the Amiga's custom chips use the first 512K of memory for display and sound purposes. Therefore, if many windows or screens are open, you may not have enough CHIP memory for a maximum size superbitmap. The routines included in Listing One check for memory availability. If there is not enough memory present for the requested superbitmap, the routine exits cleanly.

Table One:
Bitmap Arrays

Bitmap Array Element	Description
bm& + 0	Width in pixels divided by 16
bm& + 2	Height of the superbitmap
bm& + 4	Special flags
bm& + 5	Bitmap's depth
bm& + 8	Address of the first bitplane
bm& + 12	Address of the second bitplane
bm& + 16	Address of the third bitplane
bm& + 20	Address of the fourth bitplane
bm& + 24	Address of the fifth bitplane
bm& + 28	Address of the sixth bitplane

Table Two:
Window Arrays

Window Array Element	Description
NewWindow%(0)	Window's x1-coordinate
NewWindow%(1)	Window's y1-coordinate
NewWindow%(2)	Window's width
NewWindow%(3)	Window's height
NewWindow%(4)	Window border colors
NewWindow%(7)	Window flags
NewWindow%(13)	Window's title
NewWindow%(15)	Window's screen address
NewWindow%(17)	Window's superbitmap
NewWindow%(20)	Window's minimum width
NewWindow%(21)	Window's minimum height
NewWindow%(22)	Window's maximum width
NewWindow%(23)	Window's maximum height

Table Three:
Window Flags

Flag Name	Value	Description
ACTIVATE	4096	Set for a current window
BORDERLESS	2048	Window has no borders
GIMMEZEROZERO	1024	Enables protected borders
WINDOWDEPTH	4	Enables the depth gadgets
WINDOWDRAG	2	Enables a moveable window
WINDOWSIZING	1	Enables a sizeable window

The program sets up a superbitmap array in the format in which the machine expects the data. The format that the Amiga expects is shown in Table One. This array is not a standard AmigaBASIC array; instead, it is an array of bytes allocated with `AllocMem`. The routine stores the beginning address of the bitmap array in a variable we will call `bm`.

The first element in Table One is the width of the bitmap divided by 16. Any size that is nondivisible by 16 is rounded up to the next closest size divisible by 16. That is, if you were to choose a width of 310, it would be rounded up to 320. However, most of the ROM Kernel drawing routines will clip off the parts of the drawing operation at the size in pixels which you originally specified (in this example, 310).

The second element is the number of rows, or the height in pixels of the bitmap. The third element, special flags, is initially cleared and requires no additional setting. The fourth element is the depth of the bitmap, which sets the possible number of colors. This value is always less than or equal to the associated screen depth.

All of the above elements are filled in by the program with a single call to `InitBitmap`:

```
InitBitmap (Bitmap_Array%, depth, width, height)
```

The next set of elements in the bitmap array is made up of the actual bitplane addresses. The segments of memory designated by these addresses contain the text and graphics. To allocate a bitplane address, call the `AllocRaster` routine:

```
Plane(0) = AllocRaster (width, height)
```

You must call this function for each bitplane that you wish to use. The more bitplanes that you allocate, the more colors your display can have. For example, 5 bitplanes allow for 32 colors. After calling these functions, you will have created the first part of the superbitmap.

WINDOWS

The next step is to construct the window in order to see a portion of your bitmap. To make a window, you must set up some data in a special form. Setting up a window in this way is accomplished using an integer array called `NewWindow`. The integer data can be entered into this array directly, while the long integer data must be `POKE`d in. Many of the array elements are the same as those in BASIC's `WINDOW` statement.

In Table Two you will notice the list of array elements that you can set. Those which are not shown must not be entered, because they will be initialized by Intuition. The first two elements describe the `x1`- and `y1`-positions of the window relative to the upper left corner of the screen. The second set of two contain the width and height for the window, not exceeding the screen size.

The next parameter sets the window border colors, which are not normally available in BASIC. With this parameter you could have the window frame in color 5 and the title text in color 10, for example. This requires a special way of specifying the colors, using the hexadecimal number system. The colors are determined as follows:

```
NewWindow(4) = &Hddbb
```

where `&H` is the prefix for hexadecimal in BASIC, `dd` contains the title text color, and `bb` contains the window frame color. Note that

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in hexadecimal color 5 is 05, 10 is 0A, 18 is 12, and 31 is 1F. Thus, if you use the standard Workbench colors (blue, white, black, and orange) and you specify `&H0203`, the result is an orange window with black title text.

The next element in your `NewWindow` array is the flags parameter. Window flags are a set of bits that describe which type of window Intuition should open for you. Table Three lists the flags and their values. To set the flags, simply insert a statement that adds together the values from the table, as in the following example:

```
flags% = 4096 + 1024 + 2
```

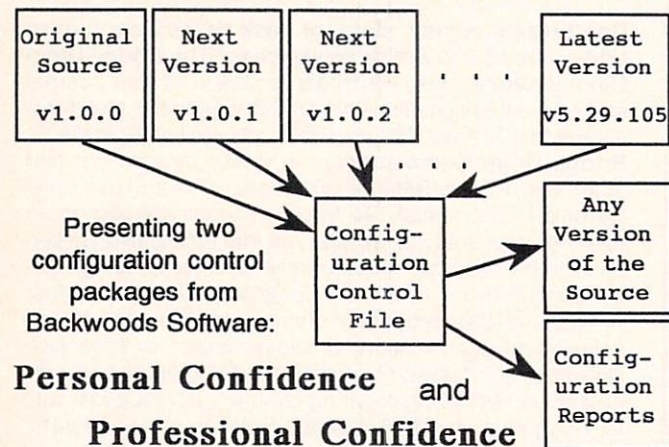
This statement sets the `ACTIVATE`, `GIMMEZEROZERO`, and `WINDOWDRAG` bits. The `flags%` statement must precede the first `CALL` to `SUPER.BITMAP` in your program. Below is a complete description of each of the flag variables:

ACTIVATE: If you open your window with this flag set, it becomes the currently active window.

BORDERLESS: This flag specifies a window with no borders. You must set either `GIMMEZEROZERO`, described below, or `BORDERLESS`. Do not set both.

GIMMEZEROZERO: This flag prepares a window whose borders are safe from overwriting. If you do not set this flag, the borders will be destroyed when you scroll. If you wish to use any of the system flags (defined below), or wish to have a title for this window, set this flag rather than `BORDERLESS`. The following are the system flags:

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WINDOWSIZE: This flag enables the window to be sized from its minimum width and height to its maximum width and height with the sizing gadget in the bottom right corner of the window.

WINDOWDEPTH: With this flag you can rearrange the layering of the windows by using the depth gadgets in the upper right corner of the window.

WINDOWDRAG: This flag enables the window to be moved around the screen with the drag gadget in the window's title bar.

The next element in the `NewWindow%` array is the title. The window's title is the name that is found in the drag bar. This is set by `POKE`ing the title's string address, using the BASIC command `SADD`, into `NewWindow%(13)`:

```
POKE VARPTR(NewWindow%(13)), SADD("your title")
```

The next element is the screen variable. This is where a screen address (not the ID number, as in BASIC's `SCREEN` statement) is `POKE`d. To find the screen address for a BASIC `SCREEN`, do the following:

1. Create a temporary window on this `SCREEN` with BASIC's `WINDOW` statement.
2. Set a long integer variable (for example, `wd%`) equal to `WINDOW(7)`.

3. Use `WINDOW CLOSE` to close the temporary window. The effect of the above statements occurs quickly enough to be almost unnoticeable.

4. A quick `PEEK` is all that is required now:
`sbase%=PEEK(wd% + 46)`

Next is the most important variable of the `NewWindow%` array: the bitmap array address, which will be placed at `NewWindow%(17)`.

```
POKE VARPTR(NewWindow%(17)), bm%
```

The variable `bm%` was discussed earlier in the *BITMAP ARRAYS* section, while the remaining four variables are the minimum and maximum values to which the window can be resized.

After you have completed all this, you can finally attempt to open the window:

```
wd% = OpenWindow( VARPTR(NewWindow%(0)) )
```

CALLING THE ROUTINES

This section describes how to use the ready-made functions from Listing One. They have been prepared for simple use by any AmigaBASIC programmer.

Listing One has some routines that handle the opening, scrolling, drawing into, and closing of a superbitmap. These routines use BASIC's `SUB...STATIC...END SUB` procedures. Please note: These routines require that you insert an `ON ERROR...GOTO` statement in your program to instruct BASIC where to go in the event of a `SUPER.BITMAP` error. Let's take a look at each of these functions now.

```
CALL SUPER.BITMAP(md$,window_id%,x%,y%,w%,h%,title$,flags%,bd%,bw%,bh%)
```

md\$: The mode flag, containing either "open" or "close," including the quotation marks. (Case does not matter—i.e., both "open" and "OPEN" are acceptable.)

window_id%: Determines which `SCREEN` the superbitmap will appear on. If you wanted to have your superbitmap on the Workbench screen, you would enter a zero in this parameter. If you wanted to have your superbitmap on a BASIC `SCREEN`, you would simply enter the number of a `WINDOW` already on this `SCREEN`. If you don't already have a `WINDOW` on this `SCREEN`, open a `WINDOW`, `CALL SUPER.BITMAP`, and then `CLOSE` the `WINDOW`. This is a shortcut that allows `SUPER.BITMAP` to attach itself to the screen. In either case, `SUPER.BITMAP` will generate its own window, and not use those above.

x%: The x1-coordinate of the window.

y%: The y1-coordinate of the window.

w%: The window's width in pixels.

h%: The window's height in pixels.

title\$: The string to be placed in the title bar at the top of the window.

flags%: A value that specifies which kind of superbitmap window to open. The value to enter is the number resulting from adding together the flags you want from Table Three.

bd%: The depth of the superbitmap. This value should be no larger than the depth of the screen it resides on.

bw%: The superbitmap's width in pixels. This value cannot be greater than 1024 or less than the window's width plus one.

bh%: The superbitmap's height in pixels. This value cannot be greater than 1024 or less than the window's height plus one.

Example:

```
' Open a superbitmap 800 wide by 300 high by 2 planes deep on a
' window 270 wide by 150 high with the ACTIVATE bit set.
```

```
ON ERROR GOTO Quit
```

```
CALL SUPER.BITMAP("open",0,50,50,270,150,"title",4096,2,800,300)
```

```
' Place a Quit routine at the end of the program to catch any
errors.
```

The next function scrolls the superbitmap around after it has been opened.

```
CALL SCROLL.SUPER(dx%,dy%)
```

dx%: The number of pixels to scroll the superbitmap in the x-direction. Negative numbers scroll to the left, while positive numbers scroll to the right.

dy%: The number of pixels to scroll the superbitmap in the y-direction. Negative numbers scroll up, while positive numbers scroll down.

Example:

```
ON ERROR GOTO Quit
```

```
CALL SUPER.BITMAP("open", wd%,bm%,50,50,270,150,"title",
4096,2,800,300)
```

```
' Scroll the bitmap 200 pixels left and 10 pixels down.
```

```
CALL SCROLL.SUPER(200,10)
```

```
' Place a Quit routine at the end of the program to catch any
error.
```

To close down a superbitmap after it has been opened simply call `SUPER.BITMAP()` with all zeros except for the `md$`, which should be set to "close."

Example:

```
CALL SUPER.BITMAP("close", 0,0,0,0,0,0)
```

DRAWING ROUTINES

Listing One also contains some drawing routines, since this is not a standard BASIC WINDOW. Each of these use many of the same parameters as those of the BASIC functions. They must be used after calling `SUPER.BITMAP()`.

The first routine clears off the entire bitmap to the specified color:

```
CALL SUPER.CLS (c1%)
```

c1%: The color to clear the screen with.

The next routine draws lines, hollow boxes, and solid boxes:

```
CALL SUPER.LINE (x1%,y1%,x2%,y2%,md$)
```

x1% and x2%: The starting and ending x-points, ranging from 0 to the maximum width of your superbitmap.

y1% and y2%: The starting and ending y-points, ranging from 0 to the maximum height of your superbitmap.

md\$: The mode flag, which must be one of the following:

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Circle 137 on Reader Service card.

" " a line.
"B" a hollow box.
"BF" a solid box.

(Case does not matter—i.e., "b" and "B" are both acceptable.)

The next routine prints a string at the current (x,y) position:

```
CALL SUPER.PRINT (s$)
```

s\$: The string to print.

The next routine prints a string at the (x,y) pixel specified:

```
CALL SUPER.PRINT.AT (x%,y%,s$)
```

x%: The x-coordinate to print at.

y%: The y-coordinate to print at.

s\$: The string to be printed.

The next routine draws a single pixel at the specified (x,y) position.

```
CALL SUPER.PSET (x%,y%)
```

x%: The x-coordinate to draw at.

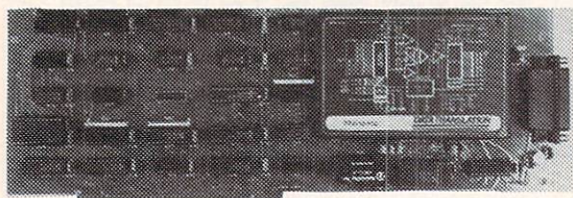
y%: The y-coordinate to draw at.

The next routine sets the foreground and background colors and the desired draw mode:

Let ACDA Open Your Real World Window !

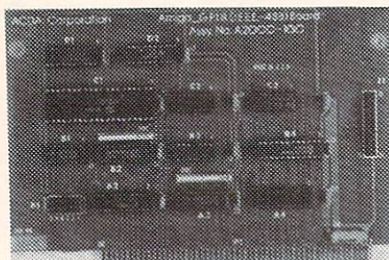
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PROTO-40K

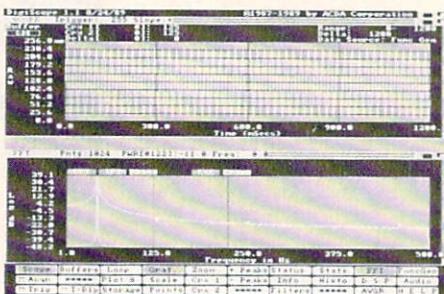


Proto-40K is the first and only fully featured data-acquisition and process-control expansion card for the Amiga 2000. The Proto-40K features a 16 channel 12-bit multiplexed analog-to-digital converter, two 8-bit digital-to-analog converters, a 3-channel programmable timebase, 16 digital inputs and 16 digital outputs. Proto-40K also features a highly stable instrumentation amplifier with programmable gain, multiple triggering sources, and on-board digital waveform generation. Data acquisition and process control projects are a snap to develop with the Proto-40K Data Acquisition System (DAS) software and 'C' source code. Sample application programs and source are included for each of the Proto-40K functions. Now sold in various custom component configurations. Buy only the functions you need. Call for new lower pricing.

Amiga GPIB



Amiga GPIB is a General Purpose Interface Bus card for the Amiga 2000. This half-length expansion card performs all the Talker, Listener, and Controller functions of the GPIB (IEEE-488) protocol. One Amiga can control up to 14 GPIB devices. Includes Command Function Library (ACDA GPIB CFL), test application program and 'C' source code driver. \$495.00



DigiScope

DigiScope is a digital storage oscilloscope emulator that works with ACDA's Proto-5K, Proto-10K or other parallel-port digitizers. DigiScope has 16 independent waveform buffers, a digital signal processing (DSP) package, a Fast Fourier Transform (FFT) package and a filtering package. DigiScope has extensive waveform scrolling functions that work in a resizable scope window in high or low screen resolution. DigiScope offers a complete set of archival functions and the standard complement of signal statistics. DigiScope also features an extensive digital waveform generator package. \$139.95

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AmigaView 2.0

AmigaView is an object-oriented, C language, Intuition front-end interface library that provides over 100 easy-to-use routines and macros. Our package features WINDOWS, SCREENS, MENUS, REQUESTERS, GADGETS OF ALL TYPES (including automatic mutual exclusion), BITMAPS, ALL IMAGERY, IFF, TEXT, and much more. This standardized and consistent Intuition/Graphics interface greatly reduces programming time and code space for professional applications development. AmigaView works with both MANX and LATICE. See AmigaWorld (Sept./Oct. 1987, p.28) for review. \$79.95

Amiga FFT C Package

The Amiga FFT C Package Provides all the source you need to perform detailed frequency analysis utilizing a complete set of Fast Fourier Transform (FFT) routines. The package includes C source for derivation of the Power-Spectrum, Phase-Amplitude Spectrum, Inverse FFT, several window functions and user interface functions. \$152.00

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Circle 104 on Reader Service card.

CALL SUPER.COLOR (a%,b%,md%)

a%: The foreground pen to draw with.

b%: The background pen to draw with.

md%: The draw mode, which can have any of the following values, either added together or alone:

- | | |
|----------------|---|
| 0 = JAM1 | Draw only the foreground color. |
| 1 = JAM2 | Draw both the foreground and background colors. |
| 2 = COMPLEMENT | Draw in exclusive OR mode. |
| 4 = INVERSVID | Draw with the foreground and background reversed. |

The next function sets the text position for SUPER.PRINTO. It assumes that you use TOPAZ EIGHTY font. This is the 80-column text from Preferences. If you use something else, set the lines% variable in Listing One to the height in pixels of your font:

CALL SUPER.LOCATE (y%,x%)

y%: The line you want to draw at.

x%: The x-column to draw at.

SOME FINAL THINGS YOU SHOULD KNOW

Please note: You cannot depend on CTRL-C to stop program execution and close the window if something goes wrong! You can, however, try to call SUPER.BITMAP from AmigaBASIC's output window in an attempt to close the window if you get into trouble. Also, when writing a program containing a superbmap, be sure to save before running it to avoid loss from a possible crash.

All the variables in the routines above (except sbm.window.base% in the routine Super.Bitmap.Libraries) are STATIC. This means that the SUBs in Listing One never have to be changed. If you use a name like x% (for example) for one of these routines in your part of the program, you must make sure that you aren't damaging your x% value, which you set earlier in the program. There is only one reserved, variable, sbm.window.base%, which is defined in Listing One under the routine Super.Bitmap.Libraries. It must be present and cannot be changed or modified during program execution.

Listing One

```
*****
'Listing #1. This contains the necessary functions for
opening,
'closing, scrolling, and drawing on a super bitmap.
*****
```

Super.Bitmap.Libraries:

```
DECLARE FUNCTION OpenWindow%() LIBRARY
DECLARE FUNCTION AllocRaster%() LIBRARY
DECLARE FUNCTION AllocMem%() LIBRARY
LIBRARY "exec.library"
LIBRARY "graphics.library"
LIBRARY "intuition.library"
LIBRARY "layers.library"
sbm.window.base%=0
RETURN
```

SUB SUPER.BITMAP

```
(md$,wd%,x%,y%,w%,h%,title$,flags%,bd%,bw%,bh%) STATIC
SHARED sbm.window.base%
md$=UCASE$(md$)
IF md$="CLOSE" AND bm%<>0 THEN GOSUB Close.Super.Bitmap :
EXIT SUB
```

(continued on page 51)

Sneak Preview

AMIGA 3000

Editor's Note: On April 24, 1990 Commodore Business Machines announced the Amiga 3000. We were fortunate to have seen an early release of the A3000 while it was still being completed. Here are the first hints of what Commodore has produced.



After years of speculation and rumors, the Amiga 3000 is now a reality. From the A3000's sleek new case design to its advanced electronics, Commodore has redefined the art of Amiga computing. Along with the addition of a newly revised operating system, Commodore is presenting the Amiga marketplace with a third tier of Amiga computers aimed squarely at the business and professional markets.

The advanced features of the A3000 include the Motorola 68030 microprocessor, in your choice of 16 or 25 MHz with either a 68881 or 68882 math coprocessor (FPU) respectively. The one Meg of Chip RAM is expandable to 2 Meg on the motherboard. The one Meg of Fast RAM is expandable to 4 Meg on the motherboard using 4 Megabit chips (this can be greatly increased with new higher density RAM chips). The total Fast Memory addressable is 1 Gigabyte.

At press time, the pricing of the above machines were not firmly established. However, one company executive expected the 16 MHz 68030/68881 system to sell for \$3299 and the 25 MHz 68030/68882 system to retail at \$3999. Both machines are shipped with a 40 MB 19 ms hard disk.

V2.0 Software

Also still in preparation at press time is the operating system, V2.0. The initial press materials presented for the A3000 promised a completely revamped and improved code with many new features. One point of note is the new Preferences

editors. Preferences has been made more manageable by being broken into an easily upgradeable set of Preferences editors. New preference additions have also been promised such as Workbench Pattern Editor, System/Screen/Workbench Fonts Editor, and Workbench Screen Editor.

The basic plan is to provide the A3000 user with a completely customizable interface. This new work environment is created by the user. This makes the Amiga personal computer one of the most "personal" available.

Features in V2.0 at press time include an enhanced shell, a new hard drive backup utility (called HDBackup in Icon form and BRU through the CLI), ARExx, a new Commodities Exchange utility, scaleable bit mapped fonts, and completely revised Workbench menus. System utilities were revised to standardize gadgets, icons, requesters, and menus to achieve a higher level of productivity and ease.

Current plans on the initial release of the A3000 with V2.0 are very similar to the marketing and construction practices used on the A1000. A modified ROM will be shipped with the first machines which will boot the system and download the desired operating system into RAM. While this will take up some RAM space and require time, it does allow Commodore to supply updates to the operating system in a post production situation. Upgrades will be supplied on disk. Once the final version of V2.0 is set, all A3000 owners will be issued a new ROM with the new V2.0.

One further advantage to the ROM download practice is the ability to maintain

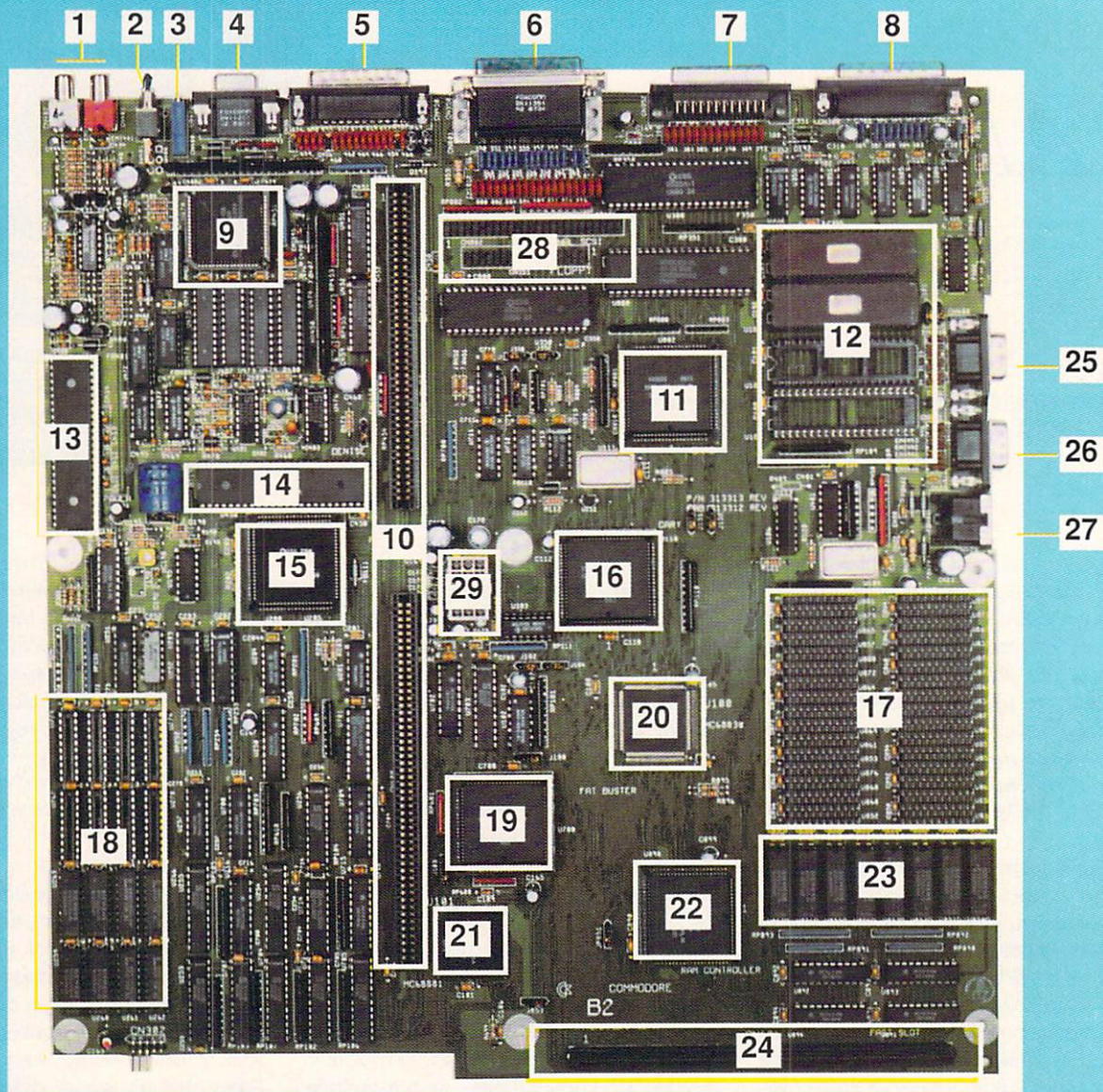
V1.3 compatibility. The engineers at Commodore have managed to allow A3000 owners a choice at the initial boot. When the A3000 is first started the user can push both mouse buttons to summon a menu of operating system alternatives. Since both V1.3 and V2.0 reside in separate partitions on the hard drive, either can be selected. There is also an option to boot your choice of operating systems from floppies.

The A3000 Hardware

Looking strangely similar to the IBM PS/2 series of computers, the Amiga 3000 is clearly one of the best looking Amigas produced so far. Commodore's focus is set squarely on delivering a computer that is not only highly functional and pleasant to look at, but physically easy to use as well. From the tilt stand designed into the monitor to the handy connections for mouse and keyboard on the side of the unit, Commodore has succeeded in eliminating some nagging complaints of the A2000.

The redesigned package also includes a few surprises under the hood. Commodore designed the A3000 with small touches to correct items which were difficult or awkward on previous machines. Internal floppy drives and hard drives are now mounted on a small adapter plate which is then secured firmly to the A3000 chassis with a single screw. The components are not only easier to install, but their alignment is perfect. Commodore has improved this front mating so well that they provide both a one drive and a two drive front for each A3000.

A3000 MOTHERBOARD



1 RCA STEREO JACKS,
STEREO-MONO JUMPER
SELECTABLE

2 VDE SELECTOR SWITCH

3 VIDEO FINE-TUNE
ADJUSTMENT

4 VGA CONNECTOR

5 AMIGA VIDEO CONNECTOR

6 SCSI & PARALLEL
CONNECTORS

7 EXTERNAL FLOPPY DISK

8 SERIAL CONNECTOR

9 AMBER GATE ARRAY,
CONTROL LOGIC FOR VDE

10 SYSTEM EXPANSION BUS

11 SUPER DMAC GATE ARRAY,
DMA CONTROLLER FOR SCSI

12 SYSTEM ROMS/EXPANSION

13 PAULA, AUDIO-I/O
PROCESSOR

14 DENISE, ENHANCED
VERSION SUPPORTING 1280
PIXEL SUPERHIRES MODE

15 FAT AGNUS (2 MEG)

16 FAT GARY GATE ARRAY,
SYSTEM ADDRESS DECODING

17 FAST RAM (ZIP)

18 CHIP RAM

19 FAT BUSTER GATE ARRAY,
DMA ARBITRATION FOR
MOTHERBOARD

20 MC68030
MICROPROCESSOR, 16/25 MHZ

21 MC68881/82 MATH
COPROCESSOR

22 RAMSEY GATE ARRAY,
DYNAMIC-STATIC RAM
CONTROLLER

23 FAST RAM (DIP)

24 FAST PROCESSOR SLOT

25 MOUSE/JOYSTICK PORT

26 MOUSE/JOYSTICK PORT

27 KEYBOARD CONNECTOR

28 INTERNAL SCSI/FLOPPY
CONNECTORS

29 SYSTEM POWER
CONNECTOR, 135 WATT
POWER SUPPLY

Expansion cards are added in a horizontal configuration. This adaptation was necessary to lower the height of the base without redesigning the large number of support and expansion cards already available for the A2000. While the A3000 will accept these earlier cards, it has also established a new standard called Zorro III.

Zorro III

The A3000 Zorro III expansion card slots have the same 100 pin standard as the Zorro II expansion card slots on the A2000. According to an early release from Commodore, "The Zorro III expansion card standard offers full-featured 32 bit address and data path access to the expansion devices, while maintaining backward compatibility with existing A2000 Zorro II cards on a cycle-by-cycle, slot-by-slot basis." The Commodore release went on to say, "We have created an environment that not only allows 32 cards to exist in the same slot form factor as the original A2000 cards, but can actually allow the user to run both 16 bit and 32 bit cards simultaneously!"

The new Zorro III specification allows access to a Gigabyte address space. While it is clearly noted that the memory chips required to create a Gigabyte of RAM are not yet available, the idea that the A3000 can exceed the 8 Megabyte limit as well as extend the limit so much farther than any other popular computer platform is extremely exciting. The A3000 will be allowed to expand as fast as better and larger memory chips become available.

Although the A3000 and the A2000 video slots are identical, the A3000 video slot is in line with a Zorro III expansion slot. This requires a slight modification for

existing video cards to fit in the A3000, but Commodore is shipping a mechanical adapter plate to adapt existing video cards to the standard PC-compatible back chassis. Your A2000 card must have been built to the standards presented by Commodore. Connectors not placed in the designated areas will not be accessible.

The chief advantage to this arrangement is the ability of any new video card designed for the A3000 to fit in both sets of signals with a single card. This singular design modification eliminates connector cables which are threaded through your equipment and the requirement of a second card. Commodore views the first elimination as a means to cut down interference and the second elimination as a way to bring down the cost of video boards.

One other expansion connection of note is the new 200 pin CPU expansion card connector. Removing the present 68030 CPU to upgrade the machine is impossible since the CPU is soldered to the

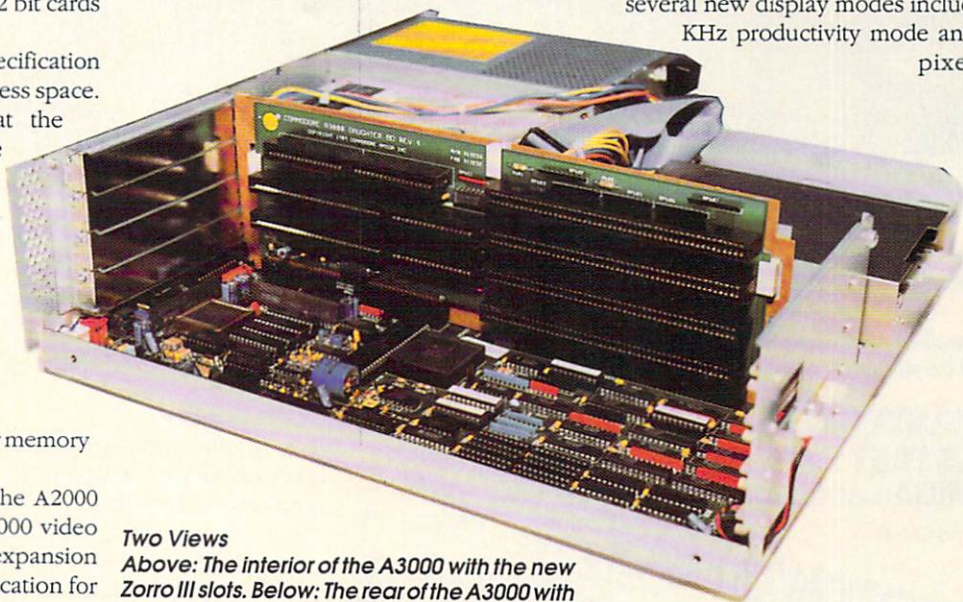
motherboard. Commodore offers this new connector as an upgrade path for a variety of products from ultra-high-speed static RAM cards, to CACHE card products, to new 68040 or RISC based processor cards.

Deeper into the chips

The A3000 is also unique in applying the 68030. Commodore provides a math coprocessor standard with each system (either the 68881 with the 16 MHz or the 68882 with the 25 MHz). The A3000 also allows the 68030 CPU to function as a true 32 bit device. 32 bit paths are used wherever possible. This includes access to both fast and chip RAM, the system ROMs, the SCSI DMA controller, as well as via the new Zorro III ports to the expansion bus.

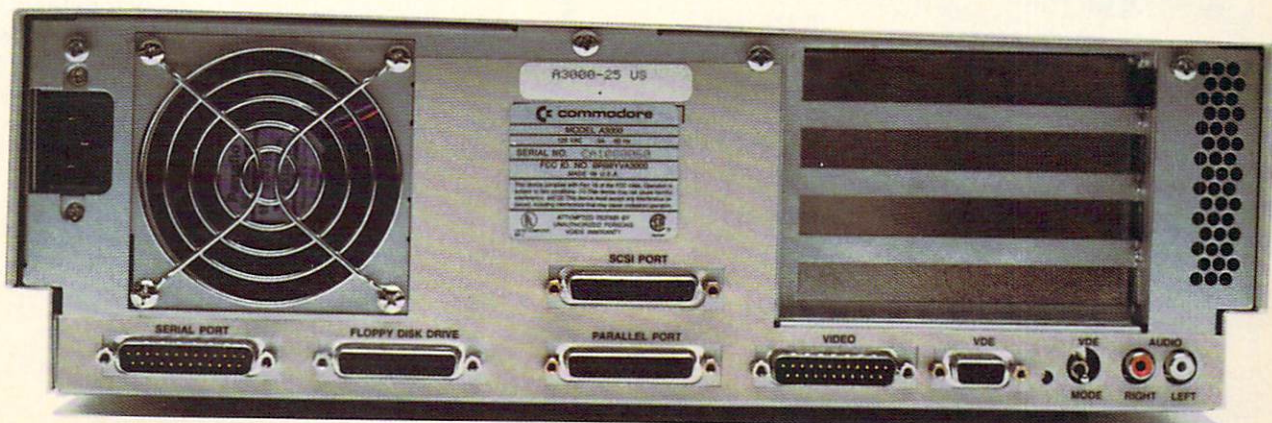
Commodore's effort has included a great deal of work in the development of custom chips. The new enhanced chip set, ECS, includes a revised Denise as well as a new Agnus. Agnus now provides 2 MB addressing for chip RAM. Commodore has also promised the new ECS will support several new display modes including a 31

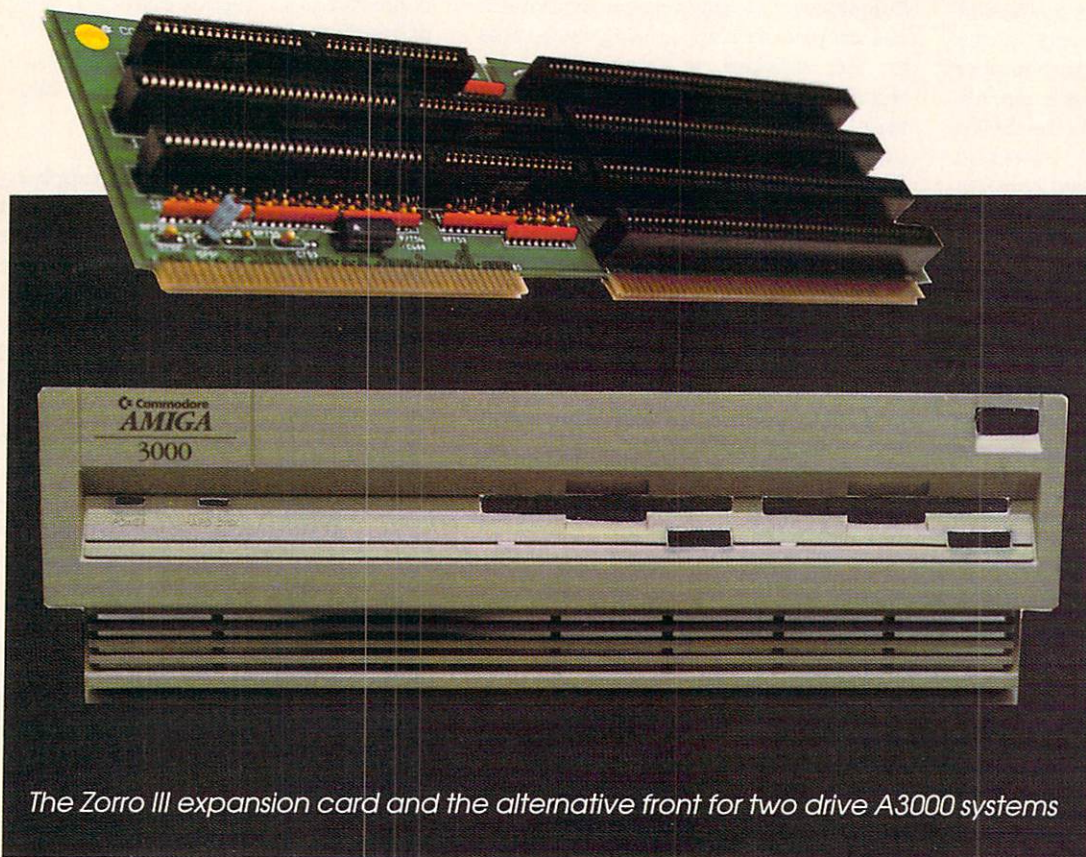
KHz productivity mode and a 1280 pixel wide



Two Views

Above: The interior of the A3000 with the new Zorro III slots. Below: The rear of the A3000 with its built-in connectors.





The Zorro III expansion card and the alternative front for two drive A3000 systems

SuperHires mode.

The A3000 also includes five new custom gate arrays. Both Fat Gary and Fat Buster are larger versions of their A2000 counterparts. Fat Gary provides address decoding while Fat Buster provides DMA arbitration for the motherboard, as well as managing and extending the expansion bus to the Zorro III standard. Super DMAC is the DMA controller for the SCSI bus interface. Ramsey controls the on board fast RAM which allows both 16 bit and 32 bit RAM to exist on the A3000. The last of the five specialized gate arrays is called Amber. Amber implements the control logic for the display enhancer. Amber supports both NTSC and PAL video output. Amber has the ability to

alternately scan double non-interlaced screens or de-interlace interlaced screens.

Chip RAM on the A3000 can be extended to 2 MB with standard 256Kx4 100 ns DRAMs. Chip RAM can also be accessed 32 bits at a time by the processor. Commodore personnel assert, "This effectively doubles the system's ability to render non-blitter drawn objects to the screen."

Conclusions?

Our experience with the A3000 at press time has been constrained to a few hours with a loaner machine and pre V2.0 software. Although V2.0 is not complete at this time, working software is available. Commodore representatives have assured us that the Amiga 3000 has received FCC approval.

The A3000 has been a long awaited computer by the Amiga community. Although several questions concerning the operating system still need to be answered, Commodore appears to have taken their time and done things correctly. A great deal of intelligence has gone into this hardware. The A3000 offers a unique step forward in Amiga computing and a bold move into the workstation market.

•AC•

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(Superbitmaps, continued from page 46)

```
IF bw% > 1024 OR bh% > 1024 OR bw% < w% OR bh% < h% THEN
ERROR 100
IF bd% > 6 OR bd% < 1 THEN ERROR 100
IF md$="OPEN" THEN GOTO Open.Super.Bitmap
ERROR 100
```

Open.Super.Bitmap:

```
DIM Plane$(5),dwh$(2)
dwh$(0)=bd% : dwh$(1)=bw% : dwh$(2)=bh%
bm%=AllocMem$(60,65536%)
IF bm%=0 THEN ERROR 101
CALL InitBitMap$(bm%,bd%,bw%,bh%)
FOR i%=1 TO bd%
  Plane$(i-1)=AllocRaster$(bw%,bh%)
  IF Plane$(i-1)=0 THEN GOSUB Close.Super.Bitmap : ERROR 101
  POKEL (bm%+(i-1)*4)+8,Plane$(i-1)
NEXT
GOTO Make.Window
```

Close.Super.Bitmap:

```
WINDOW OUTPUT 1
FOR i%=1 TO dwh$(0)
  IF Plane$(i-1) THEN
    CALL FreeRaster$(Plane$(i-1),dwh$(1),dwh$(2))
  END IF
NEXT
CALL FreeMem$(bm%,60)
IF windowopen=1 THEN CALL CloseWindow$(sbm.window.base%)
RETURN
```

Make.Window:

```
DIM NewWindow%(23)
sbase%=0
IF bm%=0 THEN EXIT SUB
IF wd%<>0 THEN
  WINDOW OUTPUT wd%
```

```
sbase% = PEEKL(WINDOW(7) + 46)
END IF
IF x% < 0 OR y% < 0 OR w% < 5 OR h% < 2 THEN
  GOSUB Close.Super.Bitmap
  ERROR 100
END IF
IF sbase%=0 THEN
  IF w%+x% > 640 THEN w%=640-x%
  IF h%+y% > 200 THEN h%=200-y%
END IF
IF sbase%<>0 THEN
  sw%=PEEKW(sbase%+12)
  sh%=PEEKW(sbase%+14)
  IF w%+x% > sw% THEN w%=sw%-x%
  IF h%+y% > sh% THEN h%=sh%-y%
END IF
title$=title$ + CHR$(0)
flags% = flags% OR &H80 'Refresh = SUPER_BITMAP
```

```
NewWindow%(0)=x% 'Left Edge
NewWindow%(1)=y% 'Top Edge
NewWindow%(2)=w% 'Width
NewWindow%(3)=h% 'Height
NewWindow%(4)=&H1 'Border Colors
NewWindow%(19)=100 'Minimum Width
NewWindow%(20)=50 'Minimum Height
NewWindow%(21)=w% 'Maximum Width
NewWindow%(22)=h% 'Maximum Height
```

```
IF sbase%=0 THEN
  NewWindow%(23)=&H1 'Workbench screen
ELSE
  NewWindow%(23)=&HF 'Custom screen
  POKEL VARPTR(NewWindow%(15)),sbase%
END IF
```

```
POKEL VARPTR(NewWindow%(5)),0 'IDCMP FLAGS
POKEL VARPTR(NewWindow%(7)),flags% 'FLAGS
POKEL VARPTR(NewWindow%(13)),SADD(title$) 'Title
POKEL VARPTR(NewWindow%(17)),bm% 'Super Bitmap
```

```
Array
  sbm.window.base% = OpenWindow$(VARPTR(NewWindow%(0)))
  windowopen=1
END SUB
```

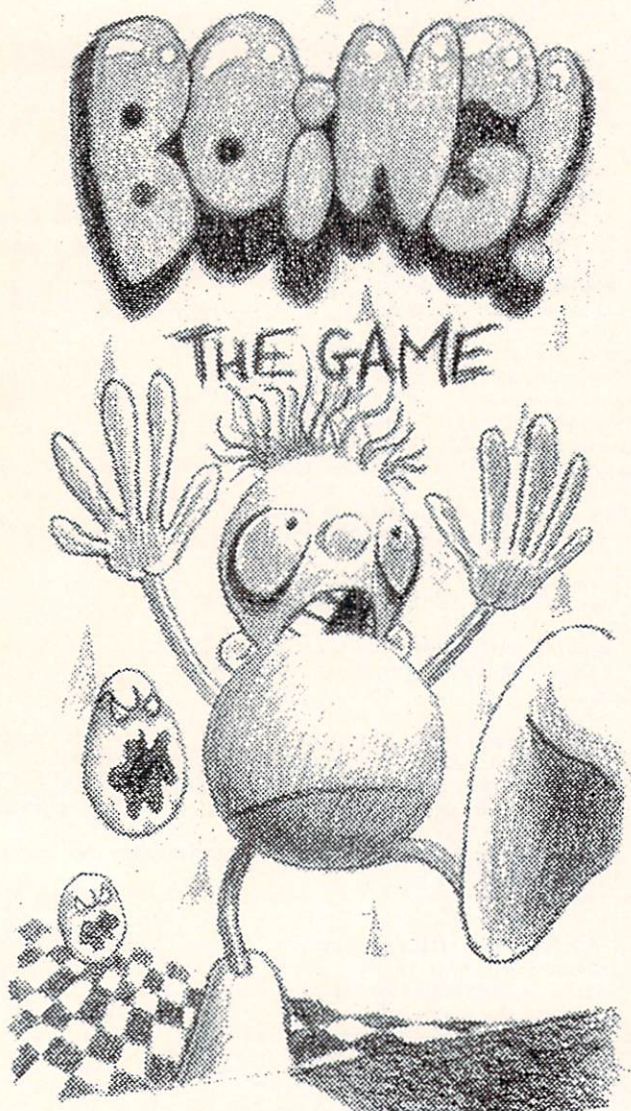
```
SUB SCROLL.SUPER (x%,y%) STATIC
  SHARED sbm.window.base%
  layer% = PEEKL(sbm.window.base%+124)
  WaitTOF%
  CALL ScrollLayer$(0,layer%,x%,y%)
  WaitTOF%
END SUB
```

```
SUB SUPER.CLS (cl%) STATIC
  SHARED sbm.window.base%
  rport% = PEEKL(sbm.window.base%+50)
  CALL SetRast$(rport%,cl%)
END SUB
```

```
SUB SUPER.LINE (x1%,y1%,x2%,y2%,md$) STATIC
  SHARED sbm.window.base%
  rport% = PEEKL(sbm.window.base%+50)
  md$=UCASE$(md$)
```

```
IF md$="" THEN
  CALL Move$(rport%,x1%,y1%)
  CALL Draw$(rport%,x2%,y2%)
ELSEIF md$="B" THEN
  CALL Move$(rport%,x1%,y1%)
  CALL Draw$(rport%,x2%,y1%)
  CALL Draw$(rport%,x2%,y2%)
  CALL Draw$(rport%,x1%,y2%)
  CALL Draw$(rport%,x1%,y1%)
ELSEIF md$="BF" THEN
  CALL RectFill$(rport%,x1%,y1%,x2%,y2%)
END IF
END SUB
```

```
SUB SUPER.PRINT (s$) STATIC
  SHARED sbm.window.base%
```

We dedicate this game to the authors of the original Boing! demo: Sam Dicker, Dale Luck, and =RJ= Mical.

Save Seymour from his imaginary cave system. Use the scattered needles to pop the evil green Boing! balls before they have him for a snack. Maneuver him up ladders, down slide-poles, and through teleporters. Watch out for falling rocks and flame-geysers.

Boing! The Game has 30 levels with up to 24 screens for each level. Includes a Level Editor so you can make your own games.

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Circle 111 on Reader Service card.
Boing! The Game written & copyright 1989,90 Kevin Kelm & Alternate Realities. Produced by Micro Momentum, Inc.

```

rport& = PEEKL(sbm.window.base&+50)
s&=SADD(s$+CHR$(0))
slen%=LEN(s$)
CALL Text&(rport&,s&,slen%)
END SUB

SUB SUPER.PRINT.AT (x%,y%,s$) STATIC
  SHARED sbm.window.base&
  rport& = PEEKL(sbm.window.base&+50)
  CALL Move&(rport&,x%,y%)
  s&=SADD(s$+CHR$(0))
  slen%=LEN(s$)
  CALL Text&(rport&,s&,slen%)
END SUB

SUB SUPER.PSET (x%,y%) STATIC
  SHARED sbm.window.base&
  rport& = PEEKL(sbm.window.base&+50)
  CALL WritePixel&(rport&,x%,y%)
END SUB

SUB SUPER.COLOR (a%,b%,md%) STATIC
  SHARED sbm.window.base&
  rport& = PEEKL(sbm.window.base&+50)
  CALL SetAPen&(rport&,a%)
  CALL SetBPen&(rport&,b%)
  CALL SetDrMd&(rport&,md%)
END SUB

SUB SUPER.LOCATE (y%,x%) STATIC
  SHARED sbm.window.base&
  rport& = PEEKL(sbm.window.base&+50)
  lines% = 8 'The font height of Topaz 80
  CALL Move&(rport&,x%*lines%+1,y%*lines%+1)
END SUB

```

LISTING TWO

```

'*****
'Listing 2. This contains a simple demonstration of the
'routines
'defined in listing 1. Make sure that you MERGE listing 1
'onto
'the end of this listing.
'*****

'First set the ON..ERROR statement for error checking.
'Then open and declare the appropriate libraries and
'functions.
'*****

ON ERROR GOTO Quit
GOSUB Super.Bitmap.Libraries
SCREEN 2,320,200,2,1

'*****
'Set the flags for the type of window that we want.
'*****
flags% = 4096+2+4+1+1024

'*****
'Open a WINDOW, Set the PALETTE colors, and open a
'SUPER.BITMAP()
'*****

WINDOW 2,,,0,2
PALETTE 0,0,0,0
PALETTE 1,1,0,0
PALETTE 2,0,1,0
PALETTE 3,0,0,1
CALL SUPER.BITMAP
("open",2,0,0,320,200,"SUPER",flags%,2,640,400)
WINDOW CLOSE 2

'*****
'Clear off the super bitmap. NOTE: when a super bitmap
'opens it
'will be filled with "garbage". You should always clear

```



```

its
'contents before drawing anything.
*****
CALL SUPER.CLS (0)

*****
'Now we'll set the fore/background colors and the draw
mode.
*****
CALL SUPER.COLOR (1,0,1) 'Red on Black with "JAM2"

*****
'Next we'll draw some fancy graphics with our drawing
routines.
*****
x%=0 : y%=0 : col%=1
FOR x%=0 TO 640 STEP 16
  CALL SUPER.LINE (x%,0,640-1,y%,"")
  CALL SUPER.LINE (640-1,y%,640-1-x%,400-1,"")
  CALL SUPER.LINE (640-1-x%,400-1,0,400-1-y%,"")
  CALL SUPER.LINE (0,400-1-y%,x%,0,"")
  col%=col%+1
  IF col%>3 THEN col%=1
  CALL SUPER.COLOR (col%,0,1)
  y%=y%+10
NEXT x%

CALL SUPER.COLOR (2,0,0)
CALL SUPER.PRINT.AT (270,200,"Hello, World!")
CALL SUPER.COLOR (1,0,0)
CALL SUPER.PRINT.AT (269,199,"Hello, World!")

*****
'Now let's scroll around the super bitmap and view its
contents.
*****
FOR i%= 0 TO 40
  FOR j%=0 TO 500 : NEXT
    CALL SCROLL.SUPER (5,5)
  NEXT j%

FOR i%= 0 TO 40
  FOR j%=0 TO 500 : NEXT
    CALL SCROLL.SUPER (0,-5)
  NEXT j%

FOR i%= 0 TO 40
  FOR j%=0 TO 500 : NEXT
    CALL SCROLL.SUPER (-5,0)
  NEXT j%

FOR i%= 0 TO 40
  FOR j%=0 TO 500:NEXT
    CALL SCROLL.SUPER (0,5)
  NEXT j%

FOR i%= 0 TO 40
  FOR j%=0 TO 500 : NEXT
    CALL SCROLL.SUPER (5,0)
  NEXT j%

*****
'A short delay and the we close down.
*****
FOR i%=0 TO 10000 : NEXT i%

Quit:
*****
'check and make sure there's actually something to close
*****
IF sbm.window.base<>0 THEN
  CALL SUPER.BITMAP ("close",0,0,0,0,0,"",0,0,0,0)
END IF
SCREEN CLOSE 2
PRINT "done."
ON ERROR GOTO 0
END

```

•AC•

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Momentum Mail

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Momentum Mail

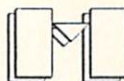
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PD Serendipity

Destination: Moonbase (Fred Fish #312)

Insight into the World of Public Domain Software for the Amiga®

Moonbase is a shareware program written by Jimbo Barber. The object of the game is to guide a spaceship full of cargo from an orbiting space station to a ground-based station. Sounds easy enough, right?

The game starts with a screen showing a space station orbiting above a planet. There are several instruments displayed to help you make decisions. There are two fuel gauges. One shows how much fuel the space station has, and the other shows how much fuel the spaceship has. If the spaceship gets low on gas, you can refuel it from the space station (as long as it isn't empty). A timer shows how much time is left to complete this mission and the number of the base station that your cargo is to be delivered to.

The first thing you must do is fill your spaceship with cargo. This is done by docking the spaceship at one of the four cargo bays of the space station. The correct one is illuminated with a green light, while the other three display a red light. You guide the spaceship by moving it left or right with the joystick (in port two) and using thrust by pressing the fire button. Once you get the spaceship close enough, autopilot kicks in and docks the ship for you.

Now that you have your cargo you must deliver it to the correct base station, whose number will be displayed on the screen. When you guide the ship off the bottom of the screen it goes out of orbit and brings you to the screen with the base stations. This screen behaves differently than the first because now you have to contend with gravity. Two base stations are displayed on one screen, and you may have to move the ship off the right or the left side to get to the correct base station.

by Mike Morrison

The next step is to land the spaceship on the base station's landing pad. This can be a little tricky. Don't be disappointed if you waste a few spaceships. After some practice you will be able to land spaceships with a much higher success rate. When the spaceship is landed the cargo is unloaded and you are ready to return to the space station for another load.

Some levels may involve several trips back and forth from the space station and the base stations. To go back to the space station for more cargo hold the fire button down and blast the spaceship off the top of the screen back into orbit. A new cargo bay on the space station will be lit with a green light and a new base station number will be displayed showing where this new load of cargo needs to go. You will probably need more fuel and can refuel by docking with the top of the space station.

During the game you can use the P key or the spacebar to pause and unpauses the game. The ESC key quits the current mission, and the Q key ends the current game.

The introduction screen is nice to watch and is a nice touch for a shareware game (graphics by Jimbo Barber and Harvey Warwick). The graphics throughout the game are well done and add a lot to the game. There is a very vivid digitized explosion when the ship explodes. (This happens if you run into anything, or run out of fuel while in orbit.) There is a high score screen that keeps the top ten scores on disk. The high score list can be cleared out if you want to start from scratch.

After the introduction animation and the shareware notice screen there is a difficulty screen. Here you can pick easy, medium, or hard game play. There is also an option that allows you to customize your game even further. Determine the number of spaceships, how much time for the game, lander speed, number of missions, lander fuel consumption, and how much fuel the space station has, to cover a few of the possibilities.

Control of your ship is something that takes a bit to master. The response of the joystick is slightly delayed and seems to me to add realism. The game is fun and I recommend that if you use it, send Jimbo the suggested shareware amount (\$10). Jimbo wrote *Star Trek: The Game*—a shareware trivia game—and he received enough responses to do Moonbase. This is a good example of how

shareware should work. Send in your share and who knows what Jimbo and others may come up with next.

China Challenge (Fred Fish Disk #312)

China Challenge is written by Dirk Hoffmann from West Germany and is freeware. China Challenge is similar to the well-known commercial game Shanghai.

The object is to remove all pieces from the pile, one pair at a time. The pile is composed of 120 different pieces, and there are four pieces with the same design.

The only way you can remove two tiles is if they have the same design. They must also be at the end of a row (both tiles must have no neighbors). To select a tile you click on it with the mouse. A duplicate of the chosen tile will be displayed on the left side of the screen. To pick another you also click on it with the mouse. It

will appear on the right side of the screen. If you have a match and want to remove the tiles, you would then double-click on the second tile chosen. If you remove all the tiles, you win!

There are several options that can be selected from the menu bar. They are:

About: A small information window appears, telling the author's name and address.

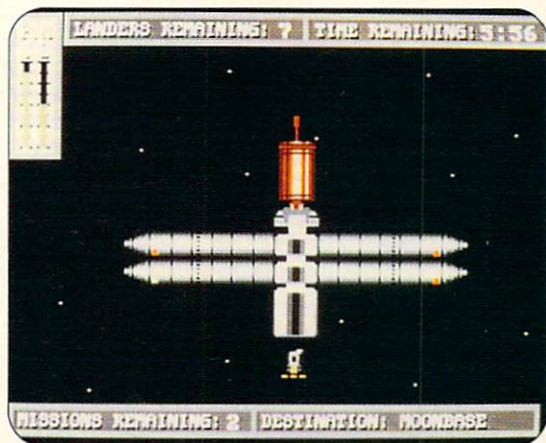
Quit: Exit China Challenge and go back to Workbench.

New Game: Starts a new game reshuffling the tiles.

Undo last move: Takes back the last move you did.

Undo all moves: Starts the same game over from the beginning.

China Challenge is as much fun to play as Shanghai is. The game pieces are different than Shanghai and this makes it interesting to play. I never had a problem running it and like Shanghai, found it to be very addictive.



ABOVE: Unloading on Destination Moonbase.



BELOW: Shanghai substitute China Challenge.

Sneak Preview

NewTek's Video Toaster.

Amiga's professional video tool is yours today!
OK, June.

For over two years the Amiga market has been waiting for NewTek to deliver the video appliance for the Amiga. Early in its career, it became known as *The Toaster*. At major Amiga shows, NewTek would have someone sitting in their booth demonstrating the latest tricks *The Toaster* could perform while other employees were busy selling new versions of Digi-Paint and Digi-View.

For over two years, NewTek spent a good deal of their time either working on *The Toaster* or explaining why it was late. Now, it appears as if NewTek will be able to justify these long years of torment. NewTek is still demonstrating *The Toaster*. Now, however, they promise shipments in May and all large quantities available in June.

In the professional video market, NewTek's *Toaster* is a hit! From high spirited magicians Penn & Teller, to the National Association of Broadcasters Convention in Atlanta, Georgia, NewTek is creating tremendous excitement with their *Video Toaster* in its final version. Sporting such abilities as frame grabbing, genlocking, special effects, and video file loading, the *Toaster* offers exceptional value for the dollar at \$1595.00.

Working from NewTek's three facilities in Topeka, Kansas, Tim Jenison has lead a troupe of transplanted Amiga programmers through two years of effort. Their purpose? To produce a product that will justify the purchase of Amigas by thousands of professional video studios across the country. Now, utilizing the *Toaster* and the special properties of the Amiga, video producers can attain

professional results at a fraction of the cost of other systems.

NewTek is taking advantage of the large quantity of available software for graphics and titling already available for the Amiga. They are also counting on the established network of Commodore Amiga dealers. Amiga dealers are already committed to the Amiga, have a better understanding of the computer and their customers' needs, and are located in every major metropolitan area. They will comprise the front line of NewTek's marketing campaign.

The Toaster

The *Video Toaster* is more than a unique application of the Amiga. The *Toaster* brings together several video applications for the Amiga in one marketable package. It can create digital



Just The Essentials:
NewTek's video studio uses cost savings and minimalism as a main theme. Even the lights are inexpensive garden lights purchased at a local discount store.

video effects, character generation, frame grab an image at 1/60th of a second from an NTSC signal, all while it fits inside your Amiga.

The Toaster allows an operator to control the incoming signal of 3 to 4 cameras. These video signals can then be used in a host of video special effects including splits, trajectories, digital trails, mosaics, montages, spins, tumbles, squeezes, zooms, and more. In fact so much more, Paul Montgomery, NewTek's CEO, cautioned that the final effects for the Toaster's release had not been selected. "Now that the hardware is finished, the programmers are still learning what they can do with it." He expressed surprise at several points of his presentation as he created effects he did not know existed.

Mark Randall, NewTek's Marketing Manager, made it clear that the Toaster is a tool for the professional video user. "It is a professional tool. We never said it was anything else."

NewTek's Toaster won best new product from *Video Magazine* at the latest National Association of Broadcasters Convention. Apparently NewTek's booth was literally attacked by professional video users. These people have the equipment and the knowledge to make the Toaster work effectively.

The main problem for the Toaster and the average user is the limits of their equipment. Current camcorders and tape decks for consumers lack the necessary input for video synchronization. This signal is necessary to produce the professional quality output the Toaster can provide. The good news is the latest releases from Japan's consumer video producers promise the capability—at a price.

NewTek's Studio

NewTek's three locations in Topeka include their production facility for order processing and administration, a secret location for NewTek programmers called Alcatraz, and their high tech low cost video studio. NewTek created the studio in a second floor office area for Penn & Teller's video as well as to demonstrate what can be accomplished cheaply. Cheaply here refers to 10 to 20 thousand dollars. The NewTek personnel are expecting their Toaster to take the place of equipment ranging from 70 to 100 thousand dollars. The NewTek system should save professional video operations a great deal of money as well as firmly establishing the Amiga in the video arena.

The studio is unpainted, unadorned, and extremely unfurnished. However, the concept here is to impress the occasional visitor with the bare necessities required to create video with a Toaster and the Amiga. While Kristine Stockhammer sat before the cameras in the studio, Paul Montgomery quickly moved through the Toaster's interface and created hundreds of special effects using only the Amiga's mouse.

The Toaster's software had not been frozen at press time. However, the interface allowed a minimum of 386 special effects from four video sources in a variety of speeds and directions. All of the current video effects shown with the toaster were two dimensional. Absent were any backward spinning or 3D effects we have seen in NewTek live demos.

Three cameras were set up as well as the Amiga. Paul deftly switched from one shot to the next to show how all control and

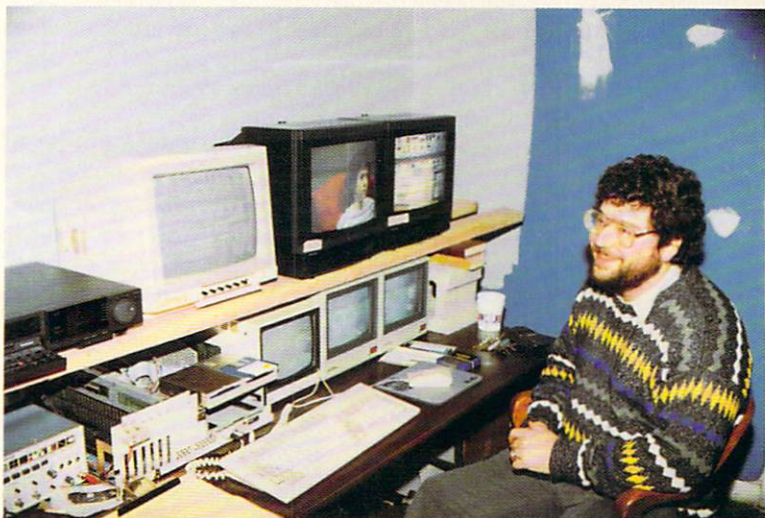
effort could be handled from the Amiga (either by keyboard or mouse). Just as in major television control rooms, there is a main camera which shows the image being broadcast, and a preview camera of the subject prior to any effect. There was also one small monitor for each camera and/or video input.

Conclusions?

We present this report as a sneak preview of new technology and not as a review of the Toaster or its capabilities. The facts expressed here were based on a pre-release version with unfinished software. We are waiting for a consumer version to test.

•AC•

NewTek
115 W. Crane St.
Topeka, KS 66603
1 (913) 354-1146
Inquiry #281



**Top: Special Video effects are the heart and soul of the Toaster.
Below: Paul Montgomery before the NewTek studio control area.**

OPERATION:

COUNTERSTRIKE

by Joe DiCara

Falcon Mission Disk

FALCON MISSION

The goal of Spectrum HoloByte has been (since 1978) to provide the most accurate simulation possible of the F-16 Fighting Falcon for personal computers. Their simulation of the F-16 was first released for MS-DOS and Macintosh machines, then came our turn just before Christmas of 1988. Immediately Falcon became the combat flight simulator of choice for the Amiga. Other than F-18 Interceptor there was nothing even close to it. Falcon, as reported last year, had all the right stuff, or at least almost.

It seems that with success comes criticism. In Falcon's situation, Spectrum HoloByte received comments and suggestions from just about everyone on how the game could be made better. So, armed with plenty of your good ideas they set out to correct flaws and add some new missions. While this seemed like a good idea, it soon became apparent that as corrections were made and the best of the suggested new features were added, what was evolving was an entirely new game. Thus, less than a year after the introduction of Amiga Falcon, Spectrum HoloByte has released The Mission Disk—Operation: Counterstrike.

OPERATION: COUNTERSTRIKE— FALCON MISSION DISK

Before going further with this review, please be advised that this release is a mission disk, not a complete program. You must have disk 2 from the original Falcon program; the Mission Disk replaces disk 1 from the original Falcon. Many of the mission disk enhancements are incorporated into a Falcon upgrade (version 1.1) which is available directly from Spectrum HoloByte. Objective: Total Defeat?

Operation: Counterstrike is a collection of missions that, if flown successfully, will result in the total destruction of the enemy's ability to make war. The campaign objective is to protect your airbase from ground attack; then, mission-by-mission in an order that you determine, cut off his ability to supply front line forces with men and material, thus ending hostilities.

The game begins with the Rolling Thunder mission. The neighbor to the northeast has been steadily building his offensive capabilities and has threatened to attack your nation. Now it seems all diplomatic efforts have failed and your Intelligence units report tanks approaching your airfield. Time is of the essence: it is essential to destroy this threat quickly. If all missions are successful, you will once again establish peace and safeguard the nation.

During this struggle you will confront amphibious landing craft, truck convoys, and trains loaded with troops and more tanks. You must attack and destroy static targets such as road and railway bridges, factories, an oil refinery, and a power station. The enemy has also improved his SAM sites, added Soviet T-80 tanks, and upgraded his fighters to MiG-29 Fulcrums. Plus, he has unveiled a secret drone to protect his airfield. And you must hunt their targets over new terrain.

STRATEGY AND SURVIVAL

As the manual points out, the key to success is survival. You must destroy all the enemy tanks on your first sortie. If they get to the base, you're finished. Once successful, you can then consider other strategic options. But you must remember that destroyed targets do not stay that way for long. While shutdown of any of the vital enemy installations and resources will probably lead to success, should one of your missions fail, factories and equipment will be repaired almost as quickly as you can destroy them. Even with success against the top targets you could still be defeated by new weaponry still in the enemy's pipeline. So, try to plan your attacks well and never miss.

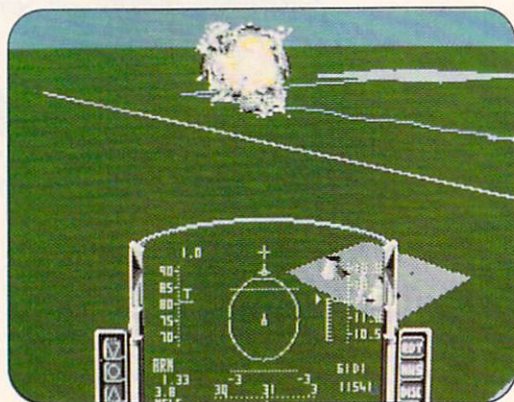
ENHANCEMENTS

The most serious problems with the original Falcon were poor control of the aircraft, and very demanding landings. Happily, the Mission Disk and upgrade have dramatically improved both. Keyboard, joystick, and both mouse modes have all been revised. The result is an F-16 that is much easier to control

and more enjoyable to fly. You will find the joystick to be the best means of control. The mouse modes, while improved, are still not up to the task.

Another former control problem was the difficulty in making small adjustments in flight direction. Now the F-16 will automatically level itself after a minor bank and course adjustment. This allows easier alignment to the target. The option can be toggled off by pressing the Z key.

Landings at all levels are much easier. If the old Falcon was damaged at all or you landed off-line, the result was disastrous. All that is now changed. Unless your bird is severely damaged, you can walk away from a rough landing—just keep all the wheels on the runway. Also, the annoying ability of the enemy to jump you while



The Heads-Up Display of an F-16 as it closes in on a nuclear power plant.

in the landing pattern has been fixed. If you fly around your field you'll notice air defense batteries at either end of the base. While I have yet to see them actually shoot anyone down, they must be effective as the MiG's leave you alone, once they come within range of the missile defense. Our own weapon production capabilities have seemingly been improved, as the Crew Chief rarely refuses to supply you with the better weapons.

Some updating has occurred in the F-16's office. The head-down display for the Maverick missile now displays a magnified image that does aid in aiming the weapon. Unfortunately, the display still does not show what the missile sees as it tracks toward the target. There is an auto-view mode that automatically switches your cockpit view for the best look at that MiG coming up your six. This feature can also be toggled with the D key.

Improvements have been made to ease loading and operation of the game. Falcon now can be run from Workbench, just by double-clicking the special icon. While any one of three methods can be used to load the game, it still does not exit gracefully—you must re-boot the system to change programs.

Installation on a hard drive is now easy: simply double-click on the "HD-Install" icon and follow the directions. When run from a hard drive, Falcon loads to the code wheel screen in just 15 seconds and after keying in the correct code letter, you're at the Duty Roster in seconds. I love it! By the way, the mission disk is still copy protected, so don't throw away your code wheel.

CONCLUSION

Spectrum HoloByte has not chosen to call this collection of enhancements Falcon II, but they could have. And yet there is room for further improvement. The mouse control must be improved, as could be the external views of the aircraft, thereby making them of greater benefit in flying the F-16. Wouldn't night missions or variable weather conditions be interesting? The multi-player data link is loads of fun, but instead of just head-to-head combat, I would like to join up with a wing man and do all the missions together. Maybe we'll find these features in Falcon III, or perhaps in something new Spectrum HoloByte has planned for future release.

A 28-page manual details the loading instructions, missions, and enhancements. Once again, it's important to note that the original Falcon program is required to use the Mission Disk.

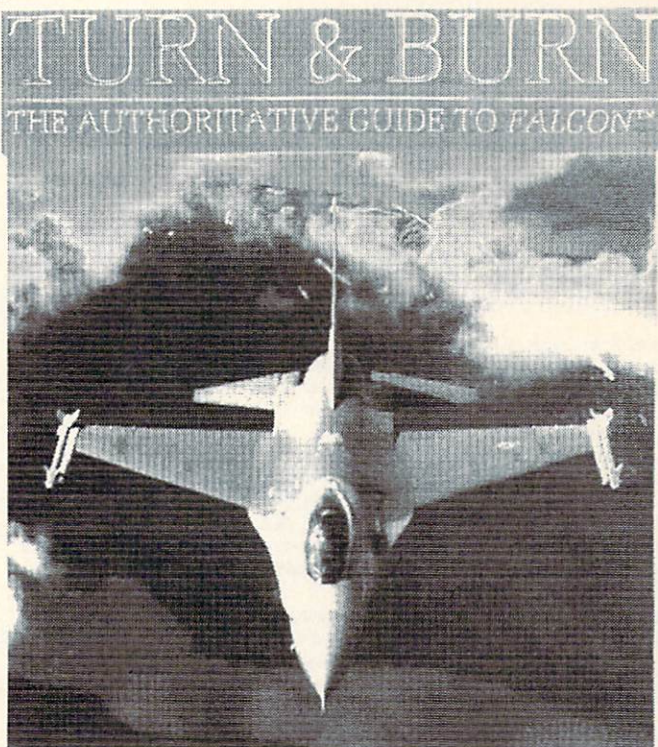
Spectrum HoloByte is making a special offer available to all registered Falcon owners. Return your original Falcon disk 1 along with \$3.00 and you will receive a new disk 1 (version 1.1). Or, send \$7.50 and receive the new disk. A third option is to send in \$24.95 and receive both the Mission Disk and the new disk 1 upgrade to Falcon.

As with Falcon, Operation: Counterstrike will work on all 512k Amigas, but 1 megabyte is recommended, and a second drive or a hard drive does enhance game play.

The improvements to Falcon, in effect, do make for a new game that provides plenty of new challenge for all would-be F-16 fighter jocks. I hope you enjoy the game as much as I do.

•AC•

**Operation: Counterstrike;
Falcon Mission Disk**
Spectrum HoloByte
2061 Challenger Drive
Alameda, CA 94501
(415) 522-0107
Price: \$24.95
Inquiry #225



Turn & Burn

THE AUTHORITATIVE GUIDE TO FALCON™

COMPUTE!'s *Turn & Burn* is a 248-page paperback that takes an in-depth look at the original *Falcon*™, Spectrum HoloByte's F-16 jet fighter simulation. It probes all aspects of the simulation from factual information about the aircraft to helpful hints in flying the actual missions. Unfortunately, *Turn & Burn* does not detail the missions on the *Operation: Counterstrike* disk, however all other aspects of the book are applicable to *Operation: Counterstrike*.

Author Howard Bornstein discusses the actual simulation and how it differs from the real Falcon, including how the simulation reacts to your progression in rank. He painstakingly describes the functions and features of the aircraft's armaments, cockpit and Heads-Up Display. He provides a helpful tutorial on flying and controlling the 16. But the greatest treasures are found in his wise and insightful explanations of the original twelve *Falcon*™ missions.

This guide was written to give every *Falcon*™ fan an unequalled edge in flying the simulated F-16 right to the edge of the envelope. Helping you get the most out of every mission, the book provides you with the material needed to become the "Best of the best!"

Turn & Burn
Compute! Publications
One Chilton Way
Radnor, PA 19809
(800) 345-1214
Price: \$12.95
Inquiry #227



AC Disks

Source code and executable programs included
for all articles printed in *Amazing Computing*.

#1 AC V3.8 and AC V3.9

Gels in MultiForth Parts I & II: Learn how to use Gels in MultiForth. Author: John Bushakra

FFP & IEEE: An Example of using FFP & IEEE math routines in Modula-2. Author: Steve Faiwizewski

CAI: A complete Computer Aided Instruction program with editor written in AmigaBASIC. Author: Paul Castonguay

Tumbler Tots: A complete game written in Assembly language. Save the falling babies in this game. Author: David Ashley

VGad: A gadget editor that allows you to easily create gadgets. The program then generates C code that you can use in your own programs. Author: Stephen Vermeulen

MenuEd: A menu editor that allows you to easily create menus. The program then generates C code that you can use in your own programs. Author: David Pehrson

Bspread: A powerful spread sheet program written in AmigaBASIC. Author: Bryan Cately

#2 AC V4.3 and AC V4.4

Fractals Part I: An introduction to the basics of fractals with examples in AmigaBASIC, True BASIC, and C. Author: Paul Castonguay

Shared Libraries: C source and executable code that shows the use of shared libraries. Author: John Baez

MultiSort: Sorting and intertask communication in Modula-2. Author: Steve Faiwizewski

Double Playfield: Shows how to use dual playfields in AmigaBASIC. Author: Robert D'Asto

'881 Math Part I: Programming the 68881 math coprocessor chip in C. Author: Read Predmore

Args: Passing arguments to an AmigaBASIC program from the CLI. Author: Brian Zupke

#3 AC V4.5 and AC V4.6

Digitized Sound: Using the Audio device to play digitized sounds in Modula-2. Author: Len A. White

'881 Math Part II: Part II of programming the 68881 math coprocessor chip using a fractal sample. Author: Read Predmore

At Your Request: Using the system-supplied requestors from AmigaBASIC. Author: John F. Weiderhorn

Insta Sound: Tapping the Amiga's sound from AmigaBASIC using the Wave command. Author: Greg Stringfellow

MIDI Out: A MIDI program that you can expand upon. Written in C. Author: Br. Seraphim Winslow

Diskless Compiler: Setting up a compiler environment that doesn't need floppies. Author: Chuck Raudonis

#4 AC V4.7 and AC V4.8

Fractals Part II: Part II on fractals and graphics on the Amiga in AmigaBASIC and True BASIC. Author: Paul Castonguay

Analog Joysticks: The code for using analog joysticks on the Amiga. Written in C. Author: David Kinzer

C Notes: A small program to search a file for a specific string in C. Author: Stephen Kemp

Better String Gadgets: How to tap the power of string gadgets in C. Author: John Bushakra

On Your Alert: Using the system's alerts from AmigaBASIC. Author: John F. Wiederhorn

Batch Files: Executing batch files from AmigaBASIC. Author: Mark Aydelotte

C Notes: The beginning of a utility program in C. Author: Stephen Kemp

#5 AC V4.9

Memory Squares: Test your memory with this AmigaBASIC game. Author: Mike Morrison

High Octane Colors: Use dithering in AmigaBASIC to get the appearance of many more colors. Author: Robert D'Asto

Cell Animation: Using cell animation in Modula-2. Author: Nicholas Cirasella

Improving Graphics: Improve the way your program looks no matter what screen it opens on. In C. Author: Richard Martin

Gels in MultiForth-Part 3: The third and final part on using Gels in Forth. Author: John Bushakra

C Notes V4.9: Look at a simple utility program in C. Author: Stephen Kemp

1D Cells: A program that simulates a one-dimensional cellular automata. Author: Russell Wallace

Colourscope: A shareware program that shows different graphic designs. Author: Russell Wallace

ShowLBM: A program that displays lo-res, hi-res, interlace and HAM IFF pictures. Author: Russell Wallace

Labyrinth II: Roll playing text adventure game. Author: Russell Wallace

Most: Text file reader that will display one or more files. The program will automatically format the text for you. Author: Russell Wallace

Terminator: A virus protection program. Author: Russell Wallace

#6 AC V4.10 & AC V4.11

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#9 AC V5.4 & AC 5.5

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The Command Line

by Rich Falconburg

In the last few issues we have been examining what might be considered as replacements to the AmigaDOS Command Line Interface. In truth, the programs described are an enhancement of that interface. None of the described utilities interfere with the normal AmigaDOS command environment—they merely add to it. As I've mentioned, this type of interface is called a shell. A shell generally modifies the manner in which a command environment responds. Most of the shells for the Amiga are designed to provide, or improve on, features of the command environment. In some operating systems, the shell is the direct connection of the user to the core of the operating system. It is the part that allows the human to communicate with the computer. This is one thing about the Amiga that makes it stand out from the crowd. It allows you to configure the user interface to nearly anything you wish it to become. This can have an unfortunate result, as having several nifty utilities that all do interesting things in different ways, many of them very similar, and usually no two alike. We have seen this very often in many of the very useful programs provided in the public domain. Check the listing

in back of this magazine. Look for all the different screen blankers and you will understand what I'm driving at. For something simple, such as a way to blank the screen or speed up the pointer, this is beneficial. It allows us, the users, a wide selection of toys to experiment with. Some of these neat little gems are fascinating in the way they accomplish a seemingly benign task. "Variety is the spice of life!"—I think that applies here.

But what happens when this variety enters into the domain of human communication with the computer? What is the result of having so many tasty choices for the keyboard fanatic? Quite often, confusion and bewilderment. I recall a few years ago complaining to some of my fellow Amigans about the lack of alternatives to the basic CLI provided by Commodore. Regular readers will recall my less-than-laudatory description of this wonderful command interface. It reminds me of my experience with another computer I own (now collecting dust); its command line editing was fashioned after such modern standards as the Teletype. Clumsy and frustrating.

The Amiga has so much potential, but much of that capability goes untapped because the command environment has not had a fully-

programmable interface to unleash the power. As the machine matures, we will need a way to accomplish background tasks such as unattended backups, network mail and message updating, file and print serving, and a host of other operations in a flexible and uncomplicated way. The Amiga is not your average personal computer. It has been designed with an operating system that can compete admirably with many of its more powerful brothers. By having a multi-tasking operating environment designed into the system, and software written to co-exist in that environment, the Amiga pulls out ahead of the pack. So why isn't it taking over the office by storm?

I think one of the problems is the limited scope of Commodore's vision of the Amiga's performance arena. We have all heard about the changes taking place at the home office and I think as a result, we will see the Amiga begin to move forward in a very positive direction. It's rumored that the Amiga 3000 will be announced the same time that UNIX System V.4 is, and that it will be a UNIX workstation using this operating system. Does this mean that the current implementation of AmigaDOS is not capable enough to compete with all the UNIX popularity? To the contrary, it means that we will have a big brother with connections to the powerful circle of users in big business. And I believe that can do nothing but improve the position of AmigaDOS. It's a natural relationship. There are bushels of PCs out there sharing data in large networks. But there are some severe limitations on a single-tasking machine when network applications come into play. The Amiga is a natural. We are now seeing more developers that recognize this, and more hardware and software that allows us to capitalize on this capability.

But there remains that question about the Command Line Interface. Someone needs to take the bull by the horns and establish a shell environment that makes integrating into the presented scenario a breeze. Actually, several programmers have. With a little more development time, one of these shell programs could be the interface of choice for users wishing to retain as much compatibility as possible with their networking counterparts. Perhaps Commodore will stop being so bullheaded and take advantage of the talent in the public arena. Properly nurtured, one of these could enjoy success as the Amiga's native command shell.

"The real power in this particular shell program lies in its ability to pass information between scripts..."

In the past, this lack has not been much of a problem for anyone but programmers, and they generally create their own ways around the limitations. As a result, some of these "workarounds" wound up growing into something more than a bag of tricks to get something done. Several of these utilities have been posted to various Bulletin Boards and thereby shared with other programmers. A few of these people have taken the initiative to improve on several features and release new versions.

There is one shell that has been released to the public that was designed from the top down as an alternative or enhancement interface for the Amiga's command environment. For the next two issues we will take a look at a couple of shell programs that are probably available at your nearest Bulletin Board System. I encourage you to experiment with them. You may find that the current command structure suits your needs and that the added capability of these shells just add to the confusion. On the other hand, you may discover that this is "just what the Doctor ordered" for that special project that you've been trying to get rolling. The obvious advantage here is that the monetary investment is minimal and your time investment need be no more than enough to convince you to forget it or to spend late hours experimenting.

I'm not going to try to explain everything the shells offer in detail. There is ample documentation with each program. I will simply provide you with a list of commands provided and perhaps a short explanation, so you may decide for yourself which one you might prefer. Both shell programs are of significant size and will take some time to download. This article has been written to provide you with enough information to make an educated decision about your preference.

Some time ago, I began using a shell program written by the very talented Matt Dillon. It has gone through several incarnations as molded by Matt, Steve Drew, and the latest change by Carlo Borreo and Cesare Dieni. The latest version is 4.00A and includes a number of changes to the original.

This is a very capable command environment and provides a variety of features. It supports full command line editing, buffer recall, aliases, multiple commands on the line, and redirection including pipes. Function key support and enhanced wild cards add to the flavor of the shell. Compatibility with ARP and ARexx support are also included.

This is a fairly complete command set. The real power in this particular shell program lies in its ability to pass information between scripts and even between processes. It provides a measure of capability above the standard AmigaShell and allows for a fair amount of customizing. The string handling is superb. Even so, some limitations exist. In my quest for an ever-better way to do things I've examined several shell environments. Next month I will introduce you to one that is fast becoming my preferred choice. We will also begin to look at some of the integration possibilities that I discussed at the top of this article. You might be surprised to learn that a good deal of powerful connectivity may be obtained from my favorite software house. Until next time...

SHELL COMMANDS

ABORTLINE	Causes the rest of the line to be aborted.	PATH	List AmigaDOS path. Will not set it.
ADDBUFFER	Same as AmigaDOS addbuffer command.	PRI	Same as CHANGTASKPRI
ALIAS	Sets a name to be a string.	PROTECT	Same as AmigaDOS
ASET	Set a variable in a way that is compatible with Aztec SET command.	PS	Similar to STATUS
ASSIGN	Same as AmigaDOS	PWD	Displays current working directory
BASENAME	Sets var specified to basename of path.	QUIT	Exit the shell
CAT	Similar to TYPE	RBACK	Run command in background
CD	Similar to AmigaDOS. "." equals the Parent directory.	RENAME (MV)	Similar to AmigaDOS. Supports multiple files.
CLOSE	Close the specified file opened by open.	RESIDENT	Similar to AmigaDOS - same as ARP
COPY (CP)	Copy files or directories.	RETURN	Exit script or shell with optional return value
DATE	Similar to AmigaDOS.	RPN	Evaluate an RPN expression using 32-bit values. Supports a variety of operators.
DEC	Decrement variable by value.	RUN	Same as AmigaDOS.
DELETE (RM)	Similar to AmigaDOS. Supports recursive delete.	RXREC	Create an ARExx-compatible port of the specified name (defaults to "rexx_csh"), then puts Shell to sleep waiting for messages on it.
DIR (LS)	-s short multi(4) column display. -d list directories only. -f st files only. -c don't change colors for directories. -n display names only.	RXSEND	Send a command to any program with an ARExx-compatible port.
DISKCHANGE	Same as AmigaDOS.	SEARCH	[-w] match string exactly [-c] case sensitive [-n] disable line numbers [-r] search directories recursively [-e] exclude lines not contain string [-q] quiet mode
ECHO	Echo string. Suppress NewLine with -n.	SET	Set a variable
ELSE	Similar to AmigaDOS.	SLEEP	Delay for value in seconds
ENDIF	Similar to AmigaDOS.	STACK	Same as AmigaDOS
EXEC	Allows referencing commands by a variable name.	STRHEAD	Extract string up to a break character
FAULT	Same as AmigaDOS.	STRINGS	Useful for finding strings in binary files
FILENOTE	Same as AmigaDOS. Shell does not list note.	STRLEFT	Extract leftmost n characters from string
FLIST	Lists the file numbers of files opened by open.	STRLEN	Place length value of a string in a variable
FLTLOWER	Filter converts to lowercase. Useful with pipes.	STRMID	Extract a string from the middle of a string
FLTUPPER	Filter converts to uppercase.	STRRIGHT	Extract right-most n characters from string
FOREACH	Process passed values.	STRTAIL	Extract string from break character to end
FOREVER	Specified commands are executed continuously.	SOURCE	Execute other scripts as command
FORLINE	Processes sequential lines. Useful for lists of filenames.	TACKON	Correctly adds a filename to a pathname, and puts the result in variable specified.
FORNUM	Similar to FOR NEXT of BASIC fame.	TOUCH	Change date stamp to current system values
GOTO	Jump to a label, forward or reverse.	UNALIAS	Remove an alias
HELP	Display available commands.	UNSET	Unset one or more variables.
HISTORY	Display the history list.	VER	Show current version name, & authors.
HOWMANY	How many invocations of the Shell are running.	WINDOW-f	(front) Window to front -b (back) Window to back -l (large) Window to maximum size -s (small) Window to minimum size -a (activate) -q (query) Lists screens and windows open
HTYPE	HEX dump of file		
IF [-n]	argument conditional argument ;		
[-n] argument	Does <argument> exist		
[-n] -f file	Does <file> exist		
[-n] -d file/dir	Test: File or Directory		
[-n] -m	Check RAM		
[-n] -t file file1..fileN	Compare timestamps		
[-n] -r rpnextpression	Evaluate RPN expression		
[-n] -v varname	Is <varname> defined		
INC	Increment variable with value		
INFO	Same as AmigaDOS		
INPUT	Request user input and place in a variable		
JOIN	Similar to AmigaDOS		
LABEL	Create a label for GOTO		
MEM	Display memory statistics		
MKDIR (MD)	Create the specified directories.		
OPEN	Open a file and redirect output of multiple commands.		
		Special system variables:	
		_prompt	string to print as the prompt
		_history	size of history buffer
		_debug	enable debug mode
		_verbose	echos lines executed
		_maxerr	highest value returned
		_lasterr	return value of last command
		_cwd	current directory string
		_passed	arguments passed to sourced file
		_path	shell search path
		_insert	default edit mode
		_titlebar	set window's title
		_clnumber	number of the current CLI



Rounding Off Your Work

by Sedgwick Simons

You write a program. Numbers are crunched. The list of answers is printed: 3.1957295, 0.76245956, 978563.21 ... While such numbers can make quite an impression on people with limited mathematical or computer literacy, the bottom line, as far as you are concerned, is typically only the first few digits: 3.20, 0.76, 978000. Unless you wrote your program with high accuracy answers in mind, the extra digits are both meaningless and useless. Even worse, these digits clutter valuable space in a text file or in a printed table.

Most programmers have faced this problem many times and have found some kind of solution. Many programming languages offer the equivalent of the AmigaBASIC "PRINT USING" command which delivers output rounded and formatted to meet unique specifications. The problem becomes a bit more challenging when dealing with numbers of vastly different magnitudes, or if you want to store your rounded and formatted answers as strings instead of just printing them out. This article will take you through a number of examples written in AmigaBASIC illustrating some versatile techniques of processing your numerical results. The principles are quite straightforward (well, maybe just a little sneaky) and should be easy to apply in your favorite programming language.

Let us begin by creating a problem. Listing One creates an array of test data using the RND function that will be needed. A wide range of magnitudes is generated, and the MOD function is used to flip the sign on every second number. A simple PRINT statement lists these numbers on the left side of the screen for future reference.

Once Listing One has been entered, different program segments are ready to be added for rounding and formatting the test data. Listing Two can be recognized as the most obvious approach. The PRINT USING command prints the test data rounded to two decimal places. This section of the program can be left out if it seems old and boring, but it does make a nice side by side comparison with the more refined upcoming techniques.

Just as an aside, notice the use of the LOCATE statement in Listing Two and in the listings that follow. The LOCATE statement positions the output from each segment of the program fifteen

columns to the right of the previous output on the screen. The output will be displayed in parallel vertical columns for comparing the handling each number by the different techniques.

Listing Three introduces a way of rounding the numbers before they are printed out. The rounded values are stored in the array round(). The principle is to multiply the number to be rounded by a power of ten, use the INT function to truncate it, then divide it by the same power of ten. The variable ndp is set to the desired number of decimal places. Thus, ndp = 2 will leave two places to the right of the decimal point, rounding, for example, 16432.947 to 16432.95. Notice that negative values of ndp are quite acceptable, and ndp = -2 would round our example to 16400.

Experience with the INT function will explain the need for the block IF statement in this listing and the next. The INT(x) function returns the integer less than or equal to x. That's fine for positive numbers, but INT(-2.1) returns -3! However, by flipping the sign before operating on a negative number, and flipping the sign back when done, this feature can be circumvented. Remember that INT truncates rather than rounds, therefore 0.5 must be added to the argument of INT to obtain the closest integer to the argument.

Before discussing Listing Four, let us briefly consider the concept of "significant figures." Whenever something is measured, the measurement is only an approximation of the true value. The measurement has some error. Any calculations made with this measurement can cause this error to propagate to the final answer. As an example, let's say any room was measured and it was found to be 12.7 feet by 16.3 feet. When the area of the room is computed, the result is 207.01 square feet.

But here's the catch: is the room exactly 12.7 feet wide? Was the measurement made by eye or with an electron microscope? Chances are the number is really not meant to be 12.700000000000 feet, but simply some value between 12.65 and 12.75 feet. If these limits are used to compute the area of the room, the range of the area is 206.195 square feet to 207.825 square feet, and the same error consideration hasn't even been given to the length of the room! So the initial area calculation, 207.01 square feet, supposedly accurate to a hundredth of a square foot, is rather deceptive!

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The fundamental rule of significant figures is that the answer should be rounded to the same number of significant figures as the least accurate measurement. A significant figure can be loosely defined as a digit which holds accuracy for calculations. (May the math gods forgive my trifling words!) Any leading or trailing zeros are usually not counted. Mathematically exact numbers, like the factor of 1/2 in the area of a triangle, are not included in the rules. In this example of the room area, the length and width measurements each have three significant figures, so the answer should be rounded to three digits. (NOT three decimal places, but a total of three digits!) In other words, 12.7 feet times 16.3 feet equals a room area of 207 square feet. The precision of that answer to the nearest square foot is much more consistent with the accuracy of the measurements.

College physics and chemistry books usually explain all about significant figures. Listing Four shows one way to round numbers to a specified number of significant figures, nsf. The power of ten technique from Listing Three is used, but with a twist. The power used is a function of the integer part of the base ten logarithm of the number being rounded, as well as the number of significant figures desired. The LOG function of AmigaBASIC gives the natural (base e) logarithm, which is converted to base ten by dividing by 2.302585. As before, the rounded values are stored in the array round() before being printed.

If a programmer has been out of touch with logarithms, bases, and such, the calculations of Listing Four may seem totally obscure. Logarithms were in common use before the age of cheap calculators, but now appear only in rather specialized situations. It's not necessary to understand all the details of Listing Four in order to use it, but a bit of experimenting while looking at a good math book should clarify the principles.

Finally, Listing Five offers a versatile trick that may solve even the most bizarre problems. The PRINT USING statement is used again, but the numbers are sent to a file in RAM; then read as character strings and stored in the array round\$. Notice that the strings in round\$ include both the word "result:" and the rounded data as formatted by the initial PRINT USING statement. AmigaBASIC ignores leading spaces when reading strings, so starting the field with some non-blank character preserves the original format from the PRINT USING statement. (If preferred, the input string can be padded with spaces, then use of the RIGHT\$ function can be made to restore the desired format.) Finally, the temporary RAM: file is deleted to keep everything tidy, and the results of this final demonstration are printed at column 60.

While this RAM: file technique may seem a bit roundabout, it is a reliable way to convert numbers and text to strings of a well defined format. If all that is being done is printing, it may not matter whether data exists as numbers or strings; other routines may accomplish what is needed. But certain applications (Bryan Catley's text routines, *Amazing Computing V3.2*, for example) first require the conversion of numeric data to strings. In such cases, the RAM: trick may provide a useful option.

If you are considering using some of these routines in your own programs, let me offer a few recommendations. First, I have

test number	print using	math rounded	four s.f.	RAM: rounded
-3.837427E-05	-0.00	0	-3.837E-05	result: -0.00
6.51861E-04	0.00	0	.0006519	result: 0.00
-2.74758E-03	-0.00	0	-.002748	result: -0.00
7.237624E-03	0.01	.01	.007237	result: 0.01
-2.526195E-02	-0.03	-.03	-.02526	result: -0.03
7.363803E-03	0.01	.01	.00737	result: 0.01
-1.558585	-0.16	-.16	-.1551	result: -0.16
4.545189	0.45	.45	.4545	result: 0.45
-3.391529	-0.34	-.34	-.3392	result: -0.34
9.545182	9.51	9.51	9.545	result: 9.51
-22.25833	-22.26	-22.26	-22.26	result: -22.26
53.18441	53.19	53.19	53.19	result: 53.19
-387.1882	-387.11	-387.11	-387.1	result: -387.11
328.9329	328.93	328.93	328.9	result: 328.93
-3823.542	-3823.54	-3823.54	-3824	result: -3823.54
9345.151	9345.15	9345.15	9345	result: 9345.15

The results of some rounding techniques.

written these routines for clarity rather than speed. If you will be using them a lot, some optimization would certainly be worthwhile. Second, consider using them as subprograms. A library of versatile subprograms can be a great set of building blocks for any programmer. Finally, this article is only intended to get you started. Your own applications may require combinations of a couple of these routines, or even a totally different approach. There's nothing like a little inventive programming to round off, er..., round out, your life.

Listing One

```
'Round Off Demonstrations'
setup:
CLS
PRINT "test number"
PRINT
DIM number(16), round(16), round$(16)
FOR i = 1 TO 16
  number(i) = RND(1) * 10^(i/2 - 4)
  IF i MOD 2 > 0 THEN number(i) = - number(i)
  PRINT number(i)
NEXT i
```

Listing Two

```
'The usual: PRINT USING'
LOCATE 1,15
PRINT "print using"
FOR i = 1 TO 16
  LOCATE i+2,15
  PRINT USING "#####.##";number(i)
NEXT i
```

Listing Three

```
'Mathematical rounding: two decimal places'
LOCATE 1,30
PRINT "math rounded"
ndp = 2
FOR i = 1 TO 16
  IF number(i) > 0 THEN
    round(i) = INT(number(i) * 10^ndp + .5)
  ELSE
    round(i) = -INT(-number(i) * 10^ndp + .5)
  END IF
  round(i) = round(i)/10^ndp
  LOCATE i+2,30
  PRINT round(i)
NEXT i
```

Listing Four

```
'Mathematical rounding: "n" significant figures'
LOCATE 1, 45
PRINT "four s.f."
n = 4 '(round to four significant figures)'
FOR i = 1 TO 16
  exponent = INT(LOG(ABS(number(i)))/2.302585)
  power = exponent - n + 1
  IF number(i) > 0 THEN
    round(i) = INT(number(i) / 10^power + .5)
  ELSE
    round(i) = -INT(-number(i) / 10^power + .5)
  END IF
  round(i) = round(i) * 10^(exponent - n + 1)
  LOCATE i+2,45
  PRINT round(i)
NEXT i
```

Listing Five

```
'Fancy Footwork: print and read using RAM:'
LOCATE 1,60
PRINT "RAM: rounded"
OPEN "ram:Round.temp" FOR OUTPUT AS #1
FOR i = 1 TO 16
  PRINT#1, USING "&#####.##";"result:",number(i)
NEXT i
CLOSE #1
OPEN "ram:Round.temp" FOR INPUT AS #1
FOR i = 1 TO 16
  INPUT #1,round$(i)
  LOCATE i+2,60
  PRINT round$(i)
NEXT i
CLOSE #1
KILL "ram:Round.temp"
```


Turn Your Amiga 1000

by George Gibeau, Jr. and Dwight Blubaugh

Are you tired of spending extra time looking for that misplaced Kickstart disk in order to get your A1000 up and running? Do you want to run a BBS but don't want to deal with the infamous Kickstart "hand" screen after a power outage? Would you like to get rid of the daughterboard and eliminate a potential source of GURU visits? If you answered yes to any of the above questions, then this hardware modification will be of interest to you. With a little bit of work and the following information, you can make your A1000 a ROM-based machine.

Your first decision is to choose which version of the Amiga ROM you want to use. When deciding which ROM version to run, carefully consider whether or not you will be running an autoboot hard drive. If you are not going to run an autoboot hard drive, then you can probably go down to the local dealer and talk him out of a 1.2 ROM that they acquired during an upgrade to 1.3 for a 500/2000 owner. If you will be running an autoboot hard drive, then you can buy the 1.3 ROM for about \$35.

You will need to gather the following tools before you begin: 25 watt soldering iron, desolderer (vacuum type—piston, not bulb—works best), thin electronic solder, small pair of wire snips, small needlenose pliers, Phillips screwdriver, flathead screwdriver, and a good volt/ohm meter.

The TTL's can be obtained from any electronics supply house such as Digi-Key Corp. PALs can be obtained from Commodore, or if needed, we can supply them. If possible, order 15ns PALs instead of the 25ns, because these will perform better.

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DISASSEMBLY OF THE MACHINE

Find a large clean work area with adequate light and electrical outlets. Cover the work area with some sort of static-proof material to help prevent part damage.

Unplug the power cord to your machine and disconnect all external devices from the computer (drives, monitor, mouse, etc.). Turn the computer upside down and remove the 5 Phillips screws holding the top and bottom pieces of the case together (organizing the screws into groups based on their origin from the machine will greatly facilitate reassembly). Carefully turn the computer back to its normal position and remove the front 256K memory cartridge (if installed) and then remove the

entire front faceplate. Next, GENTLY separate the case halves. The best way to accomplish this is to pry the top away from the bottom, one side at a time. The case is connected by 2 small hooks on each side: be careful not to pry on them too hard, or they will break. Set the top of the case off to the side, out of the way. Next, remove the metal RF shield which is held in place by 14 screws and 2 metal tabs. The tabs can be straightened with a small pair of needlenose pliers. Remove the screws and posts securing the disk drive and remove the drive, including power and data cables. The floppy LED must be removed from the front panel or disconnected at the in-line

coupling, depending on the model. Disconnect the power supply cable; a screwdriver may be needed to get the plastic tab to unhinge, and the power LED.

Now only the mother- and daughterboards should be remaining. To remove the daughterboard, unscrew the 3 small screws holding the board down (Figure One). The daughterboard is now held in place by numerous gold posts. In order to separate the daughterboard, begin on one side and gently pry up while moving around the board (do

not apply too much pressure, as you do not want to break the board). After removing the daughterboard, grasp the motherboard near the side where the mouse and joystick receptors are located, slightly pulling the side of the case away from the board, and removing it from the case. It will come away with the bottom RF shield attached. To remove the shield, straighten out the remaining metal tabs securing the shield to the board. Finally, remove the 3 plastic stand-offs that support the daughterboard—they are secured to the bottom of the motherboard by 3 small screws.

Now, there should be nothing in front of you except the motherboard. The next procedure will go faster if you have a friend handy, but it can be done by only one person. You will need to desolder and remove ALL of the gold posts. This is best accomplished by sucking the solder from the holes first, then gently pulling on the post with the needlenose pliers from the component side while heating it up from the solder side. Try not to bend the gold posts during removal, because they will be re-used later. Also, be careful not to damage the plate through holes by applying too much pressure. There are a total of 124 gold posts to remove, so take your time, and be careful not to gouge into the board with the soldering iron or you may inadvertently cut traces. After all posts have been removed, you will need to clean the old solder from the holes. This can best be done with a vacuum type desolderer. To facilitate solder removal, fill the holes with new solder, then heat up the solder and suck it out. This works better than trying to remove the old

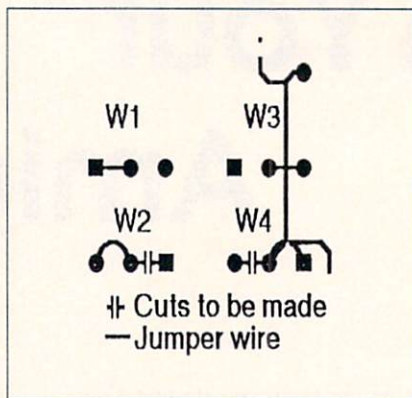


Figure Three: These are the trace modifications for the Revision 6 motherboard. W2 and W4 are the only ones modified.

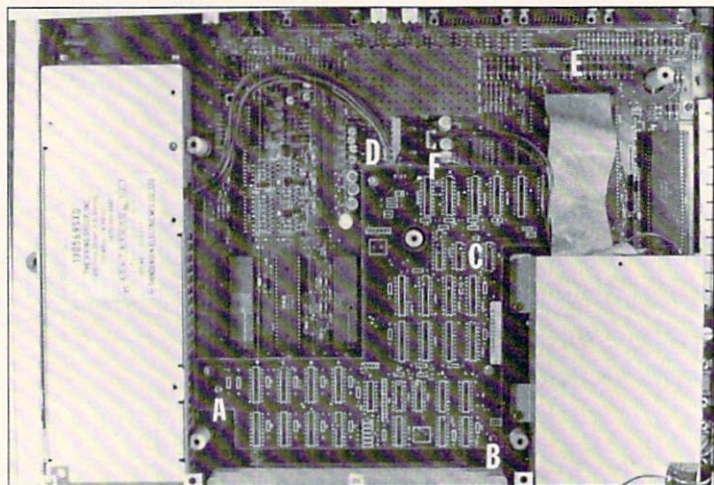


Figure One: The daughter board is held in place by 3 small screws (A-C). Also, the disk drive assembly must be removed. In addition, the following cables have to be disconnected; 1) power supply cable (D), 2) disk drive controller cable (E), and 3) the disk drive power cable (F).

solder by itself. A final cleaning of the area around the holes can be done with the aid of solder wick. This will help remove any splashes or flakes of solder that may cause problems.

Next, carefully desolder the capacitor located at C137 and save it; it will be used later. Solder the 4 TTL chips into the following locations (machine pin sockets are optional): the 74F257's into U2I and U2J (NOTE: the board is silk-screened at these spots with the

label S257, however, F series chips are used on the daughterboard. The F series is a better chip than the S series), the 74LS244's into U3G and U3I. The 20 pin IC sockets—where the PALs will be installed—go into U5L and U5M (Figure Two). Remove the 2 socketed ROMs located at U5N and U5P (but leave sockets in for now). These can be kept as mementos of your prehistoric machine days.

Next, you will have to cut 2 traces and solder 2 jumpers on the motherboard; this will vary depending on which board revision you have. If you look on the motherboard under the floppy drive, you should be able to determine the board revision. It will be either Revision 6 or Revision A.

Cut the appropriate traces and add appropriate jumpers (a small piece of 30/24 gauge copper wire, bent over, makes a perfect jumper) dependant upon the motherboard revision: for revision 6, refer to Figure Three; for revision A, refer to Figure Four.

You are finished with the motherboard for the moment—set it aside and concentrate on the Kickstart ROM adapter board.

KICKSTART ROM ADAPTER BOARD

The following instructions are for a printed circuit card available from us; if you wish to wire wrap one or etch your own, then it is assumed that you know what you are doing and are capable of following the provided pin list.

Refer to Figure Five for components and locations described in the following steps. Using the gold posts previously removed from the motherboard, place

them into the proper holes, extending just above the surface of the board. This works easier if you seat them from the bottom.

Once in place, press down on the card (top side down) to ensure that the pins are flush with the top of the card. When you are sure all pins are even, solder them in place. Next, place the 40 pin socket in the card making sure that all pins are aligned into the proper holes, as well as proper orientation (pin 1 of socket in pin 1 hole), then solder it in place. The last item to be soldered is the capacitor that was removed from the motherboard (orientation of capacitor is not important).

Provisions have been made on the card for a 512K ROM, if CBM ever uses the part. This is accomplished by a trace cut on the adapter board and a jumper to A18 on the motherboard. This signal is NOT available on the ROM sockets in a stock A1000.

TROUBLESHOOTING

Before powering up your machine, it is a good idea to check for potential errors. One of the first items to check is the adapter board. Visually inspect it for any solder bridges (solder making a connection between two spots where it should not be), or solder flakes that may have been formed during the assembly process. If you find

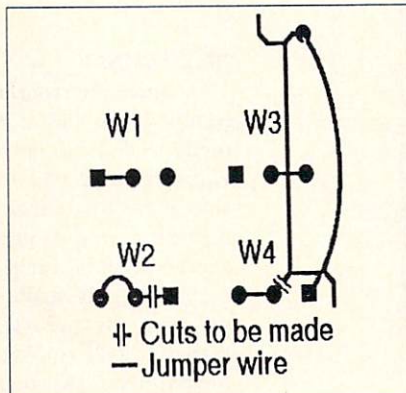
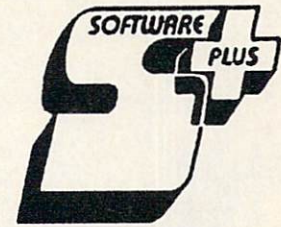


Figure Four: These are the trace modifications for the Revision A motherboard. W2 and W4 are the only ones modified.



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any flakes, carefully scrape them away, ensuring that you do not do any damage to the card in the process. Next, test the ROM chip for shorts using a volt/ohm meter. Place 1 probe on pin 1 and run the 2nd probe along the rest of the pins, then move

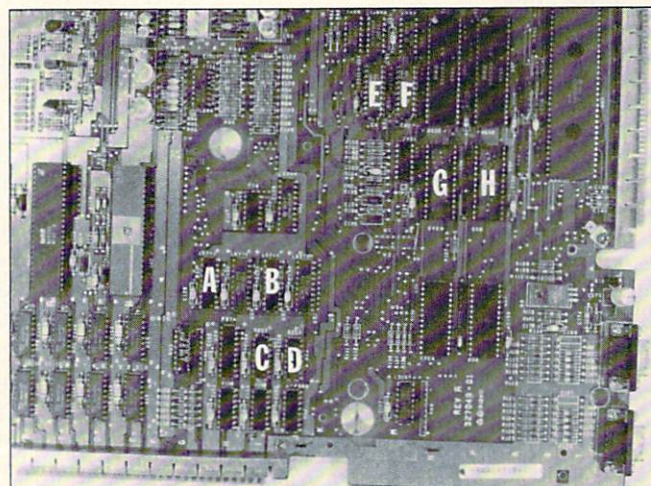


Figure Two: The 74LS244's go into A and B, the 74F257's go into C and D, the 20 pin IC sockets go into E and F, and the current ROMs are removed from G and H. In ALL instances, note the chip orientation (pin 1 is upper left).

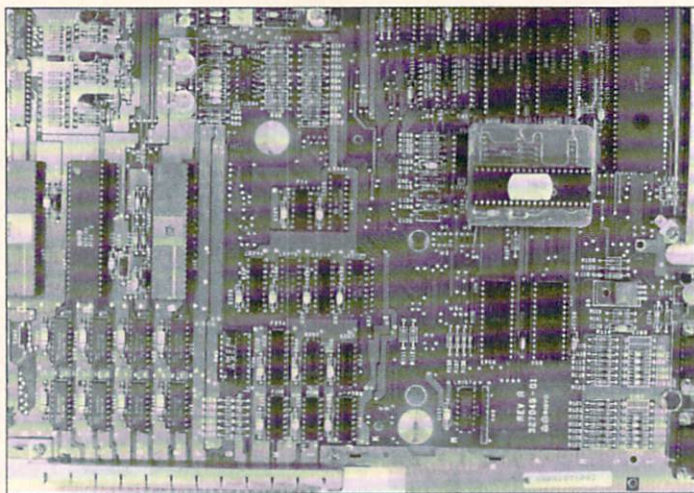


Figure Six: This is what the finished modification looks like. Notice the orientation of the ROM adapter board, as well as the absence of the daughter board. There is still enough room left for any of the internal memory expansion products.

the 1st probe to pin 2 and repeat. Continue this until all pins have been checked. The only pins that should be connected are pins 10, 11, 30, and 31 (all of them are ground). If you find any shorts, you will have to determine where the problem originates. This may take a bit of work, but if you were careful during the initial assembly this should not be necessary. Another potential source of error can be caused by heat damage which results in separation of pads and/or traces from the motherboard during the desoldering process. You will need to

Your computer should now be ready to test. Temporarily replace the motherboard in the case, hook up the power supply, disk drive (can fit in loose) and the monitor. The card that you just finished assembling will fit into the existing sockets (U5N and U5P). Make sure it is oriented in the proper manner (Figure Six). Press it into place, making sure that all pins are in the proper receptacles. Making sure nothing else is loose on the motherboard, turn on the power. If all went well, you should see the familiar gray to white cycle and in a few seconds the assuring "Insert Workbench" screen. If this is what you see, then congratulations are in order, as you have successfully completed this project; if not, then some additional error checking has to be performed. To fully explain what additional checking has to be performed is beyond the scope of this article; basically, you must obtain an A1000 schematic and verify connections to all new chips.

If your computer is functioning properly, turn off the power, disconnect all external devices, and remove the adapter board. Remove the motherboard from the case and unsolder the sockets at U5N and U5P and clean the holes as before. The sockets must be removed and the board soldered in place to ensure the proper fitting of the floppy disk drive. If the adapter board is too high off the motherboard, it will interfere with the floppy chassis. Insert

the adapter board into the proper location, maintaining proper hole alignment, and solder it into place. After you are finished soldering, trim the gold posts even with the solder.

REASSEMBLY

Since the computer is already disassembled, you may as well take this opportunity to clean it. For optimal results, use Flux-Off™ or alcohol to clean off the solder side of the board. If nothing else, blow the dust off all the components with a clean source of air and make sure all chips are seated securely on the motherboard. Now, you are ready to reassemble your machine. Replace the RF shield on the bottom of the motherboard and secure it into place with the metal tabs that are not used to hold down the top shield (a half twist with the pliers will do the job). Next, place the motherboard back into the bottom of the

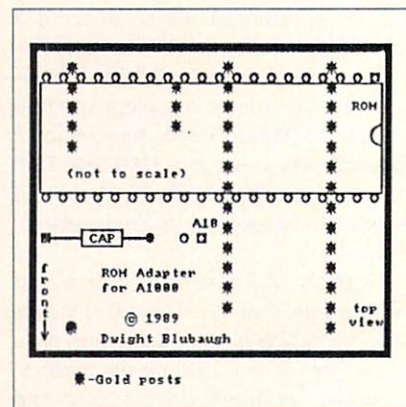


Figure Five: This is a 1-sided plot of the ROM adapter board. Follow labels as to where proper parts are placed.

plastic case and replace the 2 screws under the drive. Reconnect the power supply cable, power LED, floppy drive ribbon cable, and floppy drive power cable. Re-seat the floppy drive into its appropriate place (make sure the ribbon cable does not come off the drive) and refasten the screws and posts that hold it to the motherboard. Replace the top RF shield and secure it with the screws (make sure the correct screws go back into the proper locations). Next, replace the backplate and the faceplate, being careful not to break them (the backplate can be bent slightly). After the front- and backplates are in place, replace the top of the case and ensure that it latches into place, then secure it with the 5 screws from the bottom. After replacing the front memory module, if present, as well as the

PARTS LIST

QTY	PART TYPE
2	74F257
2	74LS244
2	20 pin IC machine socket
1	40 pin IC machine socket
1	piece 30-22 gauge wire
1	1.2 or 1.3 ROM
36	gold posts (use the ones that will be removed from the motherboard).
1	16L8 PAL (CAS)
1	16L8 PAL (EN) (for engineers, we can supply J-Dec file or the PAL equations— ***The CA A1000 docs have incorrect equations)

both visually and electronically test the circuitry. Start testing the traces as they leave the ROM sockets and make sure they are making the proper connections.

**PIN LIST FROM ROMS ON ADAPTER BOARD
TO SOCKETS ON MOTHERBOARD.**

ROM PIN	U5P PIN	U5N PIN	SIGNAL
1	14	or 14	GND (A18* for future 512K ROMs)
2	3	or 3	A8
3	4	or 4	A7
4	5	or 5	A6
5	6	or 6	A5
6	7	or 7	A4
7	8	or 8	A3
8	9	or 9	A2
9	10	or 10	A1
10	14	or 14	GND
11	14	or 14	GND
12	22	or 22	ROM*
13	11	—	D0
14	—	11	D8
15	12	—	D1
16	—	12	D9
17	13	—	D2
18	—	13	D10
19	15	—	D3
20	—	15	D11
21	28	or 28	+5 VOLTS
22	16	—	D4
23	—	16	D12
24	17	—	D5
25	—	17	D13
26	18	—	D6
27	—	18	D14
28	19	—	D7
29	—	19	D15
30	14	or 14	GND
31	14	or 14	GND (A18* for future 512K ROMs)
32	20	or 20	A17
33	1	or 1	A16
34	27	or 27	A15
35	26	or 26	A14
36	2	or 2	A13
37	23	or 23	A12
38	21	or 21	A11
39	24	or 24	A10
40	25	or 25	A9

small front cover, your machine should now be ready for normal operation.

You will have a few parts left over after reassembly. They will include: 1 daughterboard, 3 plastic standoffs, 2 ROMs, and 6 small screws. These parts should be saved just in case they are needed in the future; besides, daughterboards are valuable commodities since CBM does not sell them as spare parts.

This project has been successfully tested with the following combinations of system configurations: Spirit Technologies' IN1000 memory card with 1.5 megs installed, the Palomax hard drive interface kit, a Ronin Hurricane Accelerator card

containing 1 bare card and all necessary components (except for PALs and ROM) is \$25, and an assembled card plus other needed parts (no PALs or ROM) is \$40. For J-Dec file or PAL equations send a SASE to:

George Gibeau, Jr.
Dept. of Biology - ML06
University of Cincinnati
Cincinnati, Ohio 45221-0006
UseNet ggibeau@uccba.ucqais.EDU
BitNET pbior4w.uccvm1
On various Amiga BBS's as Ni-Lach

or

(with or without a memory card), and an ASDG memory box.

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If you do not feel comfortable performing this modification yourself, arrangements have been made with a local authorized Commodore Amiga dealer to do it for you. For more information, contact Scott Bennett at Expert Services, Florence, Kentucky, (606) 371-9690.

Parts sources:
Digi-Key Corporation
P.O. Box 677
Thief River Falls, MN 56701-9988
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•AC•

NOTES

From the C Group by Stephen Kemp

A reader recently sent me a letter asking for help in evaluating a problem he was having in converting a program that was written using the Manx C compiler to Lattice C. He didn't write the program, but he wanted to use it. Unfortunately, he couldn't just crank up his compiler and put his new program to use. The problem was not that the program wouldn't work as it was written – it probably would have. The “problem” (for lack of a better word) was that the prototyping capabilities of Lattice caused the compiler to discontinue the compilation after several dozen warning messages were issued. As I tried to point out to the reader, this was not really a “problem”. Actually, it demonstrated a very important compiler feature that requires revisiting in this column.

If you are anything like the programmers I know (including myself), the last thing you want to see from the compiler is errors. After you have made your latest changes to a source file, there are very few things worse than discovering that you made an error in the code. Sometimes, if you only get a warning related to prototyping, you will think to yourself, “I’ll worry about that later.” Many, many times, I have lived to regret that thought.

Most compilers will usually go ahead and create an object file if there are no “fatal” errors or just a few warnings. You can link your program and find it easy to forget a “simple” warning when it occurs, and never go back to repair it. You can guess what happens—the program is running fine and then BOOM! A bug shows up, you spend hours looking for it, and lo and behold, you discover you should have taken that simple prototyping warning more seriously.

This type of problem is further facilitated if you are working on a multi-module project. In these situations I use a type of “MAKE” program. This program

(and file) compares each source file to the corresponding object file and only compiles those files that have a more recent date than the object. Lattice even offers this capability on its command line. Unless the “makefile” is set up to stop when there are warning messages, they may go unseen, since a subsequent command of the makefile might cause the screen to scroll or even clear.

There are several “common” prototyping messages that you may encounter. In the following paragraphs I will mention a few warning messages that always deserve investigating. The messages given here are not specifically those from any one compiler, but rather represent a “type” of message that you might get from any compiler that supports prototyping. Each will be followed by the “danger” implied in the message, and what you should do about it.

A message of “pointers do not point to same type of object” or “incompatible pointer conversion” is potentially a real killer. These types of messages usually mean that you are trying to assign one pointer’s value into another pointer of a different type, or you are passing a different pointer type than requested by a function’s prototype. Many times an investigation will reveal that you are assigning an unsigned pointer type to a signed one or vice versa. Depending upon the circumstances, this may not cause a problem. The potential harm here, though, is this: if the pointers are indeed two different types, then subsequent use of the pointer may destroy data and/or code by referencing the data incorrectly. To prevent this message, if you are sure the code is correct, cast the pointer being assigned to the type of the destination (i.e., `ucpointer = (unsigned char *)cpointer`).

A message of “return value mismatch” indicates that one of the return statements in a function is returning a

different type than the prototype specifies. The potential error here is the same one presented in the last paragraph. The receiver of the return value from this function will assume it is the type specified by the prototype. If this is incorrect, especially in the case of returning a pointer, subsequent code or data could be destroyed unknowingly. Some compilers will issue this type of message on a function that does not have a return statement when the prototype requires one, or you might get a message of “function requires a return value”. Remember, even if you do not have a return statement, the caller of this function will receive a value if the prototype declares it. Again, assuming that the statement with this warning is correct, the way to eliminate the message is to cast the variable being returned to the type specified in the function’s prototype (i.e., `return((long)usvalue)`).

Receiving “argument count incorrect” or “incorrect number of parameters” also refers to a function’s prototype. In this case, the compiler has found a reference to a function where the wrong number of parameters is being passed. Depending upon the compiler, it may mean that too many or too few parameters were provided. Some compilers may have an alternate message of “too many parameters”, but it still means the same thing. Check this out! Sending the incorrect number of parameters can cause the function to use “random” values derived from the stack. If the function changes these values (and many functions will) then who knows what will be destroyed? The solution to this problem is simply to pass the correct number of parameters.

Messages of this nature: “incorrect function declaration”, “no prototype declared for function”, or “type mismatch in redeclaration” usually mean that a function you are defining or referencing does not have a prototype declared; or, that

it is declared differently from the way it is being referenced. If you are merely referencing a function, then check to make sure that the prototype allows the use you are attempting. If this message is flagged on the line defining a function then you have one of two problems. First, a prototype for this function already exists, and your declaration does not match that definition. This could mean that you were accidentally making a function with the same name as another function. Secondly, this message might mean that a reference to this function occurred earlier in the source module, and the compiler "assumed" a prototype that you are now redeclaring. If this is the case, be sure to issue the prototype statement in a header file or at the top of the module in which it is being referenced.

And finally, always examine code carefully when you receive a message that says: "assignment to shorter data type" or "significant digits may be lost during conversion", or any message mentioning "conversion". As with the other messages mentioned, many times the case in question may be perfectly legitimate. However, the potential for harm requires that each case be investigated carefully. Usually, this type of message means that you are assigning the value from a variable of one type into a type that is "shorter". For instance, assigning a long into a short can cause this message. Some compilers will also issue these types of messages for assignments between doubles and longs, unsigned values and signed values, etc. Remember, if you assign a longer type into a shorter one, the actual value moved may only be a portion of the original. If the code that is flagged is correct, then cast the value being assigned to the variable type of the destination.

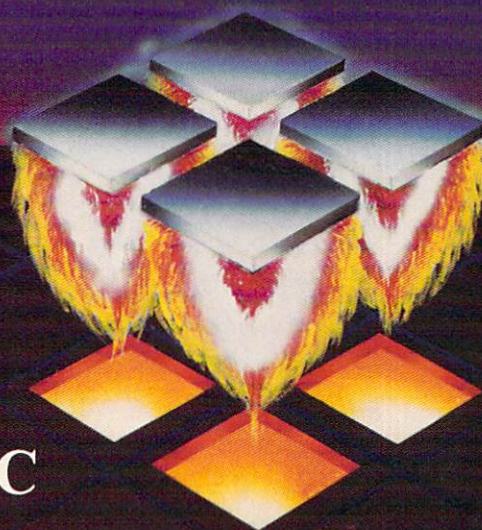
These are by no means the only messages that you can receive regarding prototyping. The point that I am trying to make is that a warning is just that—A WARNING. This means that the compiler isn't sure whether it just included the code to do what you wanted, but if you don't check, it is your own fault. In fact, after you have faced the problems that I have described a few times, you will learn to

take every message seriously—whether or not each involves "simple prototyping".

Consider it a challenge to not only write error-free, but also warning-free code. If your compiler supports prototyping and you don't use it, turn it on and eliminate those warnings. Anyone who receives your code will be glad you did. You can learn a lot from experimenting—don't be afraid to try.

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Faster BASIC

Mouse Input

by Michael S. Fabrion

I love hacking out programs in BASIC. Over the years they have grown from simple text-only games to my latest project that's too big to run under the BASIC interpreter. I have to use the AC/BASIC Compiler on it first. I would work late at night with a programming guide in one hand while pecking at the keyboard with the other. New tricks were discovered, and better graphics refined playing screens. In those early days of Amiga computing, there was a definite lack of software, especially games and educational programs geared for younger kids. So this was the area I aimed my amateurish attempts at. I was creating small games, spelling list helpers and math quizzes for my kids and posting them to area BBS's for the enjoyment of others. I soon found that kids preferred the point-and-click method to the hunt-and-peck used in the program.

Mouse input adds polish to BASIC programs. Screen gadgets can make a program truly intuitive and easier to learn. Most BASIC mouse input routines just check to see where the mouse pointer was located when the button was clicked. If you only have one or two gadgets, simple IF/THEN checking is adequate. When the user clicks the left mouse button, the IF/THEN routine compares the position of the mouse pointer when the left button was clicked with the X and Y screen boundaries of the gadgets. This type of testing can slow the exe-

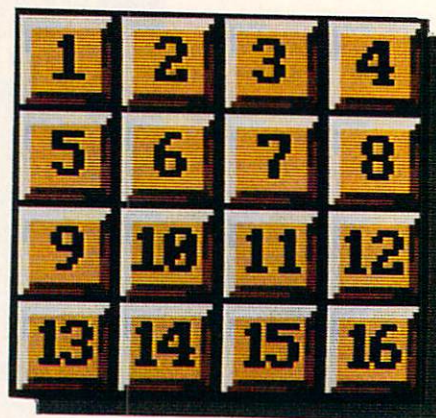


Figure One

cution of a program, if you have a large number of gadgets. Where's the mouse?

AmigaBASIC has built-in commands that read the mouse clicks and return specific values. MOUSE(0) lets your program know if the left button has been clicked or not. MOUSE(1) gives you the X coordinate and MOUSE(2) the Y coordinate. If you are not familiar with using mouse input, you can find examples in the AmigaBASIC book that came with your computer, or in one of the many programming guides currently available. In this article, I will focus on a method I've discovered to speed up mouse-click checking routines.

In the following examples, I will use Xclick and Yclick to represent the variables for the X and Y coordinates of the mouse and X1, X2, Y1 & Y2 for the minimum and maximum screen boundaries of the gadget. The fundamental programming line to check if the mouse was clicked on a gadget would be:

```
IF Xclick > X1 AND Xclick < X2 AND  
Yclick > Y1 AND Yclick < Y2  
THEN...
```

With this type of coding, each time the mouse is clicked, the computer must make four comparisons to make certain the pointer was over the gadget. Each gadget you use must have its own IF/THEN line with four position-testing statements to see if it was selected or not. No matter where the user clicks the mouse, the computer has to sort through all the checking routines to see if it has something to do.

GADGETS GALORE

The more gadgets you have, the longer it will take for your program to find out what gadget was selected. Therefore, a program with a long list of IF/THENs might not register all the input if the user happens to be quick with the mouse button. The process can be sped up by clustering your gadgets and grouping all the mouse handling routines. The program does not have to jump around when using this procedure.

For instance, for a program with sixteen gadgets, I would group them in a block of four across and four down. Arrangements can vary, but they must be grouped in order for this method of acceleration to work. You can name them whatever you wish; for ease of explanation I'll number them in this example. The setup would look like Figure One. Now you're probably wondering, "What's so great

about grouping them?" You've still got sixteen gadgets and sixteen IF/THENs with 64 greater thans and lesser thans to sort through when the mouse is clicked. No, you don't. By grouping all the gadgets and making them all the same size, a mathematical formula can be derived that will allow you to eliminate all the IF/THEN statements except one! The use of an algorithm is many times faster than sorting through a long list of IF/THEN clauses.

The cluster of sixteen gadgets I'm going to use in this example is on a medium resolution screen. To make them appear square, the size of each will be 44 pixels wide and 19 pixels high. The first gadget is located on the screen with its top left corner at pixel X-28 and Y-56. This gives gadget number one a screen area from X-28 to X-72, horizontally, and from Y-56 to Y-75, vertically. The typical routine for checking if the user selected gadget number one would be:

```
IF Xclick > 28 AND Xclick < 72 AND Yclick > 56 AND  
Yclick < 75  
THEN ...
```

Using customary BASIC coding, you would need sixteen IF/THEN lines of code that would have to perform 64 checks to see if the mouse was on one of the gadgets each time it is clicked. However, with the use of an algorithm and grouping the gadgets, you only need one IF/THEN to check for a mouse click anywhere within the area of all the gadgets. It should be located in the main loop of your program to send it to a mousehandler routine. If you are using ON MOUSE GOSUB, the IF/THEN statement should be the first line in the mousehandler module to quickly return the program to the main loop if the mouse click was not on a gadget.

CHOPPING DOWN THE NUMBERS

Take a look at the arrangement of the sixteen gadgets in the illustrated example. There are four rows and four columns. The first row is numbered one through four, the second is five through eight, and so on. The second row is also the same as the first row with four added to it, the third row is the same as the first row plus eight, and the fourth is the first row plus twelve. Four, eight, and twelve can be converted to 4 X 1, 4 X 2, and 4 X 3. As you can see, a definite pattern is forming that can be put into a mathematical formula.

If the user clicks on gadget number one, the Xclick value returned by MOUSE(1) will be greater than 28 and less than 72. The same range of Xclick values will also be true if the user clicks on gadget 5, 9, or 13. Each column has a definite individual range for the Xclick. Subtracting 27, the lowest possible value will give us a range of greater than 1 to less than 44 for column one. The rest of the columns would follow with values greater than 44 to less than 88 for column two and so on. Similarly, each row has a precise range for Yclick that is returned by the MOUSE(2) call. Applying the same logic to the Yclick, we get a range of greater

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than 1 to less than 19 for row one, greater than 19 to less than 38 for row two, and so on.

With the use of an algorithm, we can reduce the value of Xclick and Yclick to a single digit particular to the gadget selected. Each gadget is 44 pixels wide, therefore it can return any of 44 different numbers for the Xclick value. If you divide that value by 45 and drop the remainder (use the INT statement in BASIC), you will get zero, one, two, or three depending on the column location of the selected gadget. You must divide by one digit greater than the highest possible number in the range to prevent the possible error, if the user clicks on the extreme right edge of the gadget. By adding one onto these results, we get one, two, three, or four. Now the Xclick value returned by the MOUSE(1) call has been converted to match the column number of the chosen gadget. The AmigaBASIC line to change the MOUSE(1) value from a pixel number to the column number looks like this:

```
Xcolumn = ((INT(Xclick - Xmin)) /  
(GadgetWidth + 1)) + 1
```

Applying the same process to the Yclick value from the MOUSE(2) call, we can also break it down to zero, one, two, and three. The next step is to convert this to the difference between the numbers assigned to each row and the top row. Multiplying these numbers by the number of columns, in this case four, gives you 0, 4, 8, or 12. The BASIC code for converting the Y values is:

```
Yrow = ((INT(Yclick - Ymin)) *  
NumberOfColumns
```

Now look at what happens when you add these new sets of numbers. If the user selects gadget one, the new Xclick value is converted to one, and the Yclick value becomes zero. Add them together and you get one. If gadget 14 is chosen, then Xclick would break down to two, and Yclick would be converted to 12. Again adding these together gives you 14. The algorithm returns the precise number that matches what we have assigned the gadget the mouse was clicked on!

The BASIC code for the whole operation is:

```
Xclick = MOUSE(1) : Yclick = MOUSE(2)  
Xcolumn = (INT(Xclick - Xmin)) /  
(GadgetWidth + 1) + 1  
Yrow = (INT(Yclick - Ymin)) *  
NumberOfColumns  
GadgetPick = Xcolumn + Yrow
```

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The last three lines of code replace the sixteen IF/THEN routines normally required to check if the user selected a gadget. You can branch off from here to do whatever you want with a simple:

```
ON GadgetPick GO SUB ...
```

If you have an odd number of gadgets one could occupy the space normally taken by two in this arrangement. Then all you have to do is assign the same pointer to both values in the ON ... GOSUB statement.

When you have fewer gadgets, or use small gadgets, it is possible to place all information in one row or column. With this type of arrangement you only need to set up your algorithm for Xcolumn or Yrow.

My first encounter with speeding up mouse input fit right into the use of a single row of gadgets. I was working on a version of the old game Hangman, and I needed 26 gadgets to cover the alphabet. The kids were demanding mouse input because it took them too long to find the right keys to spell the words. My initial attempt used 26 IF/THEN lines with each one having four greater-than/less-than comparisons. With this setup, the kids had time to raid the refrigerator while the program hunted for the right letter. After pondering the problem for a couple of days, I hit upon the algorithm solution. The alphabet was arranged across the bottom of the screen as a single row of gadgets. One IF/THEN statement was used to check for a mouse click anywhere within the rectangle formed by the entire row of gadgets. If the mouse was clicked on a gadget, the code jumped from the main loop to an algorithm that quickly found the chosen letter. My equation to read the letter selected was:

```
GadgetPick = (INT(Xclick - Xmin)) /  
(GadgetWidth + 1) + 65
```

The use of "+ 65" returned the ASCII value for the letter selected. With this information, all that was needed was CHR\$(GadgetPick) to give me the selected letter. One short line of code eliminated almost thirty lines from my program! Long conversion routines to get from mouse click to a letter were deleted. The increase in execution time was tremendous.

It may take a bit of calculating to derive the correct formula for your arrangement and gadget sizing, but the increase in execution time is well worth it.

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Print utility

In the past, whenever I wanted a hard copy of a text file, I simply sent it to the printer using the 'type' command. This method has several drawbacks. One problem is that there are no blank lines at the top and bottom of each page. This makes some lines very difficult to read and to photocopy, especially when they are printed right on the perforation (don't you hate that?).

Another problem is when text lines are longer than 80 printed characters, all characters exceeding the 80th column are placed on top of each other in the 80th column. Now this kind of "format" is really hard to read, unless you have some incredible super-duper 3D glasses handy! Not having the 3D glasses (well, I did try the X-Specs, but they didn't help), I decided to create my own print utility that would format the text in a nice way. Since I was going through the trouble of writing one, I thought I would throw in a few extra features.

Along with performing page breaks, the print utility has the following features:

- It is invoked from the CLI just like any other AmigaDOS command. This means you do not have to be in AmigaBASIC to print text files using the AmigaBASIC version.
- At the top of each new page the file name, date, time, and page number are printed as a header.
- The print utility can print multiple files. This is done by either specifying the files themselves or by using a listfile (explained below).
- TAB characters are converted to spaces. Many printers have the TAB spacing set to eight. If a different TAB spacing is used in your text files, then either the TABs have to be reset on the printer or you end up with an incorrectly spaced printout.
- Line numbers can optionally be printed at the beginning of each line. This feature can be handy when referencing a C listing after encountering compiler errors, just as the errors are normally referenced by a line number.
- Text lines exceeding 80 columns (or any specified column width) are broken up between multiple lines when printed. The subsequent lines are indented to preserve the listing format and arrows are inserted to show where the line break occurred.
- The output can be redirected to any device or file. This feature makes creating formatted '.DOC' files easy.

I wrote the print utility first in AmigaBASIC and later converted it to C to improve execution time. The C version is written as similar as possible to the AmigaBASIC version for the benefit of AmigaBASIC programmers and beginning C programmers.

ENTERING THE PROGRAM AMIGABASIC VERSION

If you have the BASIC Linker program (*AC V3.11*), enter and save the main program and each of the subprograms shown in Listing One separately. If you use the AmigaBASIC editor, be sure to save the files in ASCII format by entering ',A' after the program name (outside the quotes). Note that the GetArgs.MSB subprogram is identical to the one listed in the tutorial 'Passing Arguments to AmigaBASIC programs' (*AC V4.4*), which describes the same technique used by the print utility to load and pass arguments to it. Remember to save each subprogram under the name shown in its 'SUB' statement. Once all of the files are created, run the BASIC Linker program to link them.

If you do not have the BASIC Linker program, enter the main program and all subprograms as one file and save it under 'Print.MSB.EXE'. The SWITCH/CASE structure in subprogram ProcessOptions.MSB must be changed to a standard IF/THEN/ELSEIF structure. To do this, make the following changes as shown in Figure One.

Once you have an executable program, you will need to find a permanent home for it. I suggest you either place the program in 'SYS:bin' or 'SYS:c' (on the Workbench disk or hard disk partition) or create a new directory such as 'SYS:msb'. Wherever you place it, the file should be accessible during normal use of your system. It's a bit inconvenient to have to insert a disk whenever you wish to print something.

The program 'Print.MSB.EXE' is loaded and executed indirectly by the script file shown in Listing Two. Enter this file and change the line with "AmigaBASIC" and "Print.MSB.EXE" to include your directory paths to each file. If 'AmigaBASIC' is located in a directory that is included in your search path (AmigaDOS 'path' command), no additional path specification is necessary for it. Save the script text under the name 'SYS:s/print' since the 's' directory is for script files (such as 'startup-sequence'). Be sure that 'SYS:s' is included in the search path:

```
path sys:s add
```

Make sure that the script bit is set in 'SYS:s/print' by using the 'protect' command:

```
protect sys:s/print s add
```

Now the print utility can be executed by simply entering 'print'.

Figure One

Line:	Change to:
SWITCH(MID\$(argv\$,2,1),1))	<delete>
CASE "l":	IF(MID\$(argv\$,2,1)) = "l" THEN
CASE "t":	ELSEIF(MID\$(argv\$,2,1)) = "t" THEN
CASE "c":	ELSEIF(MID\$(argv\$,2,1)) = "c" THEN
CASE "n":	ELSEIF(MID\$(argv\$,2,1)) = "n" THEN
CASE "o":	ELSEIF(MID\$(argv\$,2,1)) = "o" THEN
CASE "f":	ELSEIF(MID\$(argv\$,2,1)) = "f" THEN
DEFAULT:	ELSE
SWEND	END IF

ENTERING THE PROGRAM C VERSION

The C version was created with Manx Aztec-C and is shown in Listing Three. Once you have entered & saved the program, compile it and link it with:

```
cc print.c
ln print -lc
```

After compiling & linking, you will need to find a home for the program. Candidate directories include 'SYS:c' or 'SYS:bin'. Wherever you place the program, make sure that it is included in your search path. To add the directory to the search path enter:

```
path yourdir add
```

USING THE PROGRAM

Both versions of the program are executed from the CLI and behave in the same manner. The general format of the print command can be obtained by entering 'print' with no arguments. The command format is:

```
print <option ...> file <file ...>
```

where:

option -valid option:

- lxxx** *-set lines per page to xxx*
- txx** *-set TAB spacing to xx characters. In the AmigaBASIC version, a value of 0 causes the conversion code to be bypassed.*
- cxxx** *-set number of columns to xxx*
- n** *-show line numbers. Each line from the text file(s) will have a number placed in front of it.*
- oxxxx** *-redirect output to device/file 'xxxx'*
- f** *-use file(s) listed as listfile(s) rather than text files to be printed.*
- file** *-name (including directory pathnames as required of file to be printed or the name of the listfile containing names of files to be printed (when option -f specified)).*

Options must be separated by a space and can be entered in any order but must come before the file name(s). Each of the parameters set by the options has a default setting in the program. These settings are defined as 'xxx.DEF' pseudo-constants (shared variables) in the AmigaBASIC program and 'xxx_DEF' constants in the C program. These settings can easily be changed to suit your own needs. Note that the general format of the command will always reflect the current default settings.

EXAMPLES

To print a single file, you would normally enter something like:

```
print yourfile
```

where 'yourfile' is the name of the file to be printed. To print several files at one time, enter:

```
print file1 file2 file3
```

This would print three files named 'file1', 'file2', and 'file3'. Now to make things a little complicated: what if you had several files you wanted to print, and they were located in different directories? In this case, you would have to include the directory path with each file name.

Suppose you have one directory named 'C_code' on your disk that has the text files: 'my.c', 'his.c', 'hers.c', and 'yours.c' and another directory named 'Include' that contains the files 'theirs.h' and 'ours.h'. To print all of the files as one package, you would enter:

```
print c_code/my.c c_code/his.c c_code/hers.c
c_code/yours.c include/theirs.h include/ours.h
```

Now, that is quite a bit of typing! Too much if it is to be done on a regular basis. That is where a listfile comes in handy. Let us create a text file called 'TheWorks' that contains the following lines:

```
;
; TheWorks
;
c_code/my.c
c_code/his.c
c_code/hers.c
c_code/yours.c
include/theirs.h
include/ours.h
```

Now whenever you want to list everything, all you have to do is specify the listfile option (-f) and the name of this file:


```
print -f TheWorks
```

The print utility will search 'TheWorks' and attempt to print all the files listed there. Note that any line whose first character is a ';' is treated as a comment and ignored by the print utility.

To output all of the files listed above into a single text file, redirect the output by entering:

```
print -f -oNewFile TheWorks
```

All of the files will be formatted and printed into the text file 'NewFile'.

To send each of the files in 'TheWorks' to the printer with line numbers, enter:

```
print -n -f TheWorks
```

Each file will be printed with line numbers inserted to the left of the text lines.

SPEEDING UP THE AMIGABASIC VERSION

Because AmigaBASIC is an interpreted language, programs written in it are much slower than those written in a compiled language, such as C. The AmigaBASIC version of the print utility is slow because of this and because of the time it takes to load both 'AmigaBASIC' and 'Print.MSB.EXE'. Although the program's speed may not be a factor since some printers are slow, there are several things that can be done to improve the execution time:

- Remove comments. This will provide a much smaller program that will load and execute much faster. Be sure to save a copy of the program before removing the comments because changing the program could be difficult without them. If you are using the BASIC Linker program, you can have the comments removed automatically by specifying that you want the program compressed.

- Save the program as a binary file. A binary file will load much quicker than an ASCII one. If you entered the entire program from the AmigaBASIC editor, then it's probably already saved in binary form. If not, then you can save it in binary form from AmigaBASIC by entering:

```
new
load "Print.MSB.EXE"
save "Print.MSB.EXE",b
```

- Bypass TAB conversion (TABSize = 0). The TAB conversion searches every single line for TAB characters which slows things down a bit. If you do not need TABs converted, then setting the TABSize to zero will cause the conversion routine to be bypassed. If you rarely need TAB conversion, then make the TAB default in the program zero also.

- Place both AmigaBASIC and Print.MSB.EXE in the RAM: disk. If you can afford the memory, placing both AmigaBASIC and the print program in RAM: will speed up the program loading greatly. However, I have found that having the programs on my hard disk is fast enough. If you can not spare the memory and all you have are floppies, there is not much you can do to speed up the loading. Even taking a valium will not make the program load any faster (though it will seem to).

CONCLUSION

For those of you who do not have a compiled language, the AmigaBASIC version of the print utility is only the beginning of creating a custom CLI environment as powerful as the C and Modula-2 people's, albeit a little slower. For those of you who are making

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the transition from AmigaBASIC to C, you may find comparing the two versions of the utility helpful. In any case, I hope you find this print utility as useful as I have. Enjoy!

Listing One

```

'-----+
'          BASIC formatted print utility          |
'          Copyright 1989 by Brian Zupke          |
'-----+
' Allocate more memory if required
'
IF (FRE(0) < 10000) THEN CLEAR ,50000&

DIM argv$(20)          : ' Allow up to 20 arguments from CLI

DIM SHARED NoError

DIM SHARED TRUE        : TRUE = -1
DIM SHARED FALSE       : FALSE = 0

DIM SHARED LPP.DEF     : LPP.DEF = 66
DIM SHARED TAB.DEF     : TAB.DEF = 3
DIM SHARED COL.DEF     : COL.DEF = 80
DIM SHARED NBR.DEF     : NBR.DEF = FALSE
DIM SHARED OUT.DEF$    : OUT.DEF$ = "PRT:"
DIM SHARED LST.DEF     : LST.DEF = FALSE

DIM SHARED HEADER     : HEADER = 5
DIM SHARED TRAILER    : TRAILER = 3

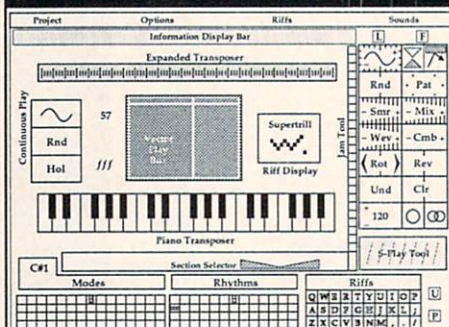
```

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THE DYNAMIC RIFF SEQUENCER

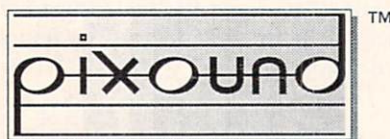


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```
DIM SHARED COL.MAX : COL.MAX = 255
DIM SHARED COL.MIN : COL.MIN = 40
DIM SHARED LPP.MAX : LPP.MAX = 100
DIM SHARED LPP.MIN : LPP.MIN = 5
DIM SHARED TAB.MAX : TAB.MAX = 20
```

```
DIM SHARED L.ARW.TEXTS : L.ARW.TEXTS = ">>>>"
DIM SHARED L.ARW.SIZE : L.ARW.SIZE = 4
DIM SHARED R.ARW.TEXTS : R.ARW.TEXTS = "<<<<"
DIM SHARED R.ARW.SIZE : R.ARW.SIZE = 4

DIM SHARED LINESPACE : LINESPACE = 5
DIM SHARED TIMESIZE : TIMESIZE = 31
```

```
LinesPerPage = LPP.DEF
TABSize = TAB.DEF
Columns = COL.DEF
ShowNumber = NBR.DEF
OutFile$ = OUT.DEFS
ListFile = LST.DEF
CurrentPage = 0
```

```
ON ERROR GOTO ProcessError
```

```
PRINT "Formatted Print Utility"
```

```
CALL GetArgs.MSB("ram:arg_temp", argc, argv$())
```

```
OPEN "ram:arg_temp" FOR OUTPUT AS #4
IF (argc = 0) THEN
```

```
PRINT#4, "FORMAT: PRT <option ...> file <file ...>"
PRINT#4, " "
PRINT#4, "option:"
PRINT#4, " "
PRINT#4, " -lxxx = set lines per page
(;"LinesPerPage;")"
PRINT#4, " -txx = set TAB size (;"TABSize;")"
PRINT#4, " -t0 = no conversion if -t0"
PRINT#4, " -cxxx = set number of columns (;"Columns;")"
```

```
IF (ShowNumber) THEN
```

```
Text$ = "yes"
```

```
ELSE
```

```
Text$ = "no"
```

```
END IF
```

```
PRINT#4, " -n = show line numbers (;"Text$;")"
```

```
PRINT#4, " -oout = cause output to go to 'out'
```

```
(";"OutFile$;")"
```

```
IF (ListFile) THEN
```

```
Text$ = "yes"
```

```
ELSE
```

```
Text$ = "no"
```

```
END IF
```

```
PRINT#4, " -f = use 'file' for listfile (;"Text$;")"
```

```
PRINT#4, " "
```

```
ELSE
```

```
FOR NextArg = 1 TO argc
```

```
IF (LEFT$(argv$(NextArg),1) = "-") THEN
```

```
CALL ProcessOptions.MSB(argv$(NextArg), OutFile$,
```

```
ListFile)
```

```
ELSE
```

```
NoError = TRUE
```

```
IF UCASE$(OutFile$) = "SCRN:" THEN
```

```
OPEN OutFile$ FOR OUTPUT AS #2
```

```
ELSE
```

```
OPEN OutFile$ FOR APPEND AS #2
```

```
END IF
```

```
IF (NOT NoError) THEN
```

```
PRINT#4, "Can't open "; OutFile$; " for output!"
```

```
PRINT "Can't open "; OutFile$; " for output!"
```

```
CLOSE 2
```

```
ELSE
```

```
PrintLines = LinesPerPage - (HEADER + TRAILER)
```

```
IF (NOT ListFile) THEN
```

```
CALL PrintFile.MSB(argv$(NextArg), PrintLines)
```

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```
ELSE
```

```
OPEN argv$(NextArg) FOR INPUT AS #3
```

```
IF (NOT NoError) THEN
```

```
PRINT#4, "Can't open list file:
```

```
";argv$(NextArg);".
```

```
PRINT "Can't open list file:
```

```
";argv$(NextArg);".
```

```
ELSE
```

```
WHILE (NoError AND (NOT EOF(3)))
```

```
LINE INPUT#3, FileName$
```

```
IF (LEFT$(FileName$,1) <> ".") THEN
```

```
CALL PrintFile.MSB(FileName$, PrintLines)
```

```
END IF
```

```
WEND
```

```
CLOSE 3
```

```
END IF
```

```
CLOSE 2
```

```
END IF
```

```
END IF
```

```
NEXT NextArg
```

```
END IF
```

```
CLOSE 4
```

```
SYSTEM
```

```
END
```

```
ProcessError:
```



```

IF ( ERR = 53 OR ERR = 61 OR ERR = 64 OR ERR = 68 OR ERR = 70 ) THEN
) THEN
    NoError = FALSE
    IF ( ERR = 70 ) THEN
        PRINT#4, "Disk write-protected!"
    ELSEIF ( ERR = 61 ) THEN
        PRINT#4, "Disk FULL!"
    END IF
    RESUME NEXT
ELSE
    PRINT#4, "AmigaBASIC error #";ERR;" occurred!"
    CLOSE
    SYSTEM
END IF
'-----+
    GetArgs.MSB
'This subprogram gets the first line of the specified input
file 'and separates the line into its separate arguments.
SUB GetArgs.MSB( FileName$, argc, argv$(1) ) STATIC
    OPEN FileName$ FOR INPUT AS #255
    LINE INPUT#255, ArgLine$
    CLOSE 255

    Argc = 0
    Char = 1
    ArgLen = LEN( ArgLine$ )
    WHILE Char <= ArgLen
        IF ( MID$( ArgLine$, Char, 1 ) = " " ) THEN
            Char = Char + 1
        ELSE
            argc = argc + 1
            x = 0
            WHILE( Char+x ) <= ArgLen AND MID$( ArgLine$,Char+x,1 ) <> "
                NonBlank = x + 1
                x = x + 1
            WEND
            argv$( argc ) = MID$( ArgLine$, Char, NonBlank )
            Char = Char + NonBlank
        END IF
    WEND
END SUB

'-----+
'Process Options
'This subprogram processes one of the valid options for the
'print command.
SUB ProcessOptions.MSB( argv$, OutFile$, ListFile ) STATIC
    SHARED Columns
    SHARED ConvertTABS
    SHARED LinesPerPage
    SHARED ShowNumber
    SHARED TABSize

    IF ( MID$(argv$,2,1) ) = "l" THEN
        LinesPerPage = VAL( MID$(argv$,3) )
        IF ( LinesPerPage < LPP.MIN OR LinesPerPage > LPP.MAX )
        THEN
            LinesPerPage = LPP.DEF
            PRINT#4,"Invalid lines per page. Changed to
";LinesPerPage
            PRINT "Invalid lines per page. Changed to
";LinesPerPage
        END IF
    ELSEIF ( MID$(argv$,2,1) ) = "t" THEN
        TABSize = VAL( MID$( argv$,3 ) )
        IF ( TABSize > TAB.MAX ) THEN
            TABSize = TAB.DEF
            PRINT#4,"Invalid TAB size. Changed to ";TABSize
            PRINT "Invalid TAB size. Changed to ";TABSize
        END IF
    IF ( TABSize > 0 ) THEN
        ConvertTABS = TRUE
    ELSE
        ConvertTABS = FALSE
    END IF

    END IF

    ELSEIF ( MID$(argv$,2,1) ) = "c" THEN
        Columns = VAL( MID$( argv$,3 ) )
        IF ( Columns < COL.MIN OR Columns > COL.MAX ) THEN
            Columns = COL.DEF
            PRINT#4, "Invalid column size. Changed to ";Columns
            PRINT "Invalid column size. Changed to ";Columns
        END IF

    ELSEIF ( MID$(argv$,2,1) ) = "n" THEN
        ShowNumber = TRUE

    ELSEIF ( MID$(argv$,2,1) ) = "o" THEN
        IF ( LEN( argv$ ) > 2 ) THEN
            OutFile$ = MID$( argv$,3 )
        ELSE
            PRINT#4,"Output file/device not specified. Option
Ignored."
            PRINT "Output file/device not specified. Option
Ignored."
        END IF

    ELSEIF ( MID$(argv$,2,1) ) = "f" THEN
        ListFile = TRUE

    ELSE
        PRINT#4, "Invalid option: ";argv$
        PRINT "Invalid option: ";argv$
    END IF
END SUB

'-----+
'Print File
'This subprogram opens 'Filename$' for input and sends output to
'output device/file #2. Errors are written to device/file #4.
SUB PrintFile.MSB( FileName$, PrintLines ) STATIC
    SHARED Columns
    SHARED LinesPerPage
    SHARED ShowNumber
    SHARED TABSize

    NoError = TRUE
    OPEN FileName$ FOR INPUT AS #1 LEN = 4096
    IF ( NOT NoError ) THEN
        PRINT#4, "Can't open file "; FileName$
        PRINT "Can't open file "; FileName$
        CLOSE 1
        NoError = TRUE
    ELSE
        PRINT "Printing file "; FileName$; "."
        LineNumber = 0
        NewPage = TRUE
        WrapAround = FALSE
        WHILE NoError AND ( NOT EOF( 1 ) )
            IF ( NOT WrapAround ) THEN
                LINE INPUT#1,SourceLine$
                IF ( ShowNumber ) THEN
                    LineNumber = LineNumber + 1
                    SourceLine$ = RIGHT$( " " +STR$(LineNumber),LINESPA(
1)+ " " +SourceLine$
                END IF
                CALL ConvertTABtoSpace.MSB( SourceLine$ )
            END IF
            IF ( NewPage ) THEN
                CALL PrintHeader.MSB( FileName$ )
                NewPage = FALSE
                CurrentLine = 0
            END IF
            IF ( LEN( SourceLine$ ) > Columns ) THEN
                CALL ProcessWrapAround.MSB( SourceLine$, WrapAround )
            ELSE
                PRINT#2, SourceLine$
            END IF
        WEND
    END IF

```



```

WrapAround = FALSE
END IF
CurrentLine = CurrentLine + 1

IF ( CurrentLine >= PrintLines ) THEN
  FOR x = 1 TO TRAILER
    PRINT#2, " "
  NEXT x
  NewPage = TRUE
END IF
WEND

CLOSE 1

IF ( NOT NewPage ) THEN
  FOR x = CurrentLine+1 TO LinesPerPage-HEADER
    PRINT#2, " "
  NEXT x
END IF
END IF
END SUB

'-----+
' Convert TABS to Spaces
'-----+

SUB ConvertTABtoSpace.MSB( SourceLine$ ) STATIC

  SHARED ShowNumber
  SHARED TABSize

  IF ( TABSize > 0 ) THEN
    IF ( ShowNumber ) THEN
      LineOffset = LINESPACE
    ELSE
      LineOffset = 0
    END IF

    NewLine$ = ""
    ToChar = 0
    FOR FromChar = 1 TO LEN( SourceLine$ )
      IF ( MID$( SourceLine$, FromChar, 1 ) = CHR$( 9 ) ) THEN
        Spaces = TABSize - ( ( ToChar-LineOffset ) MOD TABSize )

        NewLine$ = NewLine$ + SPACES( Spaces )
        ToChar = ToChar + Spaces
      ELSE
        NewLine$ = NewLine$ + MID$( SourceLine$, FromChar, 1 )
        ToChar = ToChar + 1
      END IF
    NEXT FromChar

    SourceLine$ = NewLine$
  END IF
END SUB

'-----+
' Print Header
'-----+

SUB PrintHeader.MSB( FileName$ ) STATIC

  SHARED Columns
  SHARED CurrentPage

  CurrentPage = CurrentPage + 1
  MiddleLine = INT( HEADER / 2 )
  FOR x = 1 TO HEADER
    IF ( x <> MiddleLine ) THEN
      PRINT#2, " "
    ELSE
      Header$ = LEFT$( FileName$ + SPACES( Columns-TIME$SIZE ), Columns-TIME$SIZE )
      Header$ = Header$ + " " + DATE$ + " " + TIME$ + "
Pg:"
      Header$ = Header$ + RIGHT$( " " + STR$( CurrentPage ),
4 )

      PRINT#2, Header$
    END IF
  NEXT x
END SUB

```

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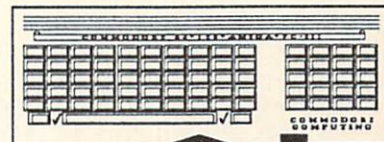
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```

'-----+
' Process Wraparound
'-----+

SUB ProcessWrapAround.MSB( SourceLine$, WrapAround ) STATIC

  SHARED Columns
  SHARED ShowNumber

  PRINT#2, LEFT$( SourceLine$, Columns-R.ARW.SIZE ); R.ARW.TEXT

  IF ( NOT WrapAround ) THEN
    IF ( ShowNumber ) THEN
      y = LINESPACE
    ELSE
      y = 1
    END IF
    FirstChar = 0
    WHILE y <= Columns - ( L.ARW.SIZE + R.ARW.SIZE ) AND
FirstChar = 0
      IF ( MID$( SourceLine$, y, 1 ) <> " " ) THEN
        FirstChar = y
      ELSE
        y = y + 1
      END IF
    WEND
    IF ( FirstChar = 0 ) THEN FirstChar = 1
  END IF

  NewLine$ = SPACES( FirstChar-1 ) + L.ARW.TEXT$
  SourceLine$ = NewLine$ + MID$( SourceLine$, Columns-
R.ARW.SIZE+1 )
  WrapAround = TRUE
END SUB

```


Listing Two

```
.key a1,a2,a3,a4,a5,a6,a7,a8,a9,a10,
a11,a12,a13,a14,a15,a16,a17,a18,a19,a20
echo >ram:arg_temp "<a1> <a2> <a3> <a4> <a5> <a6> <a7> <a8>
<a9> <a10> <a11> <a12> <a13> <a14> <a15> <a16> <a17> <a18>
<a19> <a20>"
AmigaBASIC Print.MSB.EXE
type ram:arg_temp
```

Listing Three

```
' File print utility
' This program prints ASCII files to output device or file.

#include "exec/types.h"
#include "stdio.h"
#include "time.h"

#define LPP_DEF 66 /* lines per page */
#define TAB_DEF 3 /* TAB size */
#define COL_DEF 80 /* number of columns */
#define NBR_DEF FALSE /* show line numbers */
#define OUT_DEF "PRT:" /* output destination */
#define LST_DEF FALSE /* list file */

#define HEADER 5 /* number of lines in header */
#define TRAILER 3 /* number of spaces in trailer */

#define COL_MAX 256 /* maximum width */
#define COL_MIN 40 /* minimum width */
#define LPP_MIN 5 /* minimum lines per page */
#define MAXCHAR 500 /* max characters to read/process */
#define MAXFILE 255 /* max characters in file names */
#define TAB_MAX 20 /* maximum TAB size */
#define TAB_MIN 2 /* minimum TAB size */

#define SPACE 0x20
#define TAB 0x09

#define L_ARW_TEXT ">>>" /* left arrow */
#define L_ARW_SIZE 4 /* size of L_ARW_TEXT */
#define R_ARW_TEXT "<<<\n" /* right arrow + CR */
#define R_ARW_SIZE 4 /* size of R_ARW_TEXT - CR */

#define LINEFORMAT "%4.4d " /* line number format */
#define LINESPACE 5 /* # of char. in LINEFORMAT */

/*-----+
| Header date, time, & page parameters |
| | |
| NOTMFORMAT - Format when time not available |
| TIMEFORMAT - Regular format with time |
| TIMESIZE - # of char. in time formats |
+-----*/

#define NOTMFORMAT " Pg: %3.3d\n"
#define TIMEFORMAT " %02.2d/%02.2d/%02.2d\n"
#define TIMESIZE 30

int Columns;
int CurrentPage;
int LinesPerPage;
BOOL ShowNumber;
int TABSize;

main( argc, argv)

int argc;
char *argv[];

{
extern int Columns;
extern int CurrentPage;
extern int LinesPerPage;
extern BOOL ShowNumber;
extern int TABSize;

char *fgets();
```

```
char FileName[ MAXFILE ];
FILE *fopen();
char *lineptr;
FILE *list;
BOOL ListFile;
char NewLine[ MAXCHAR ];
int NextArg;
char Output[ MAXFILE ];
FILE *printer;
int PrintLines;
char SourceLine[ MAXCHAR ];
char *strcpy();
char *Text;

LinesPerPage = LPP_DEF;
TABSize = TAB_DEF;
Columns = COL_DEF;
ShowNumber = NBR_DEF;
lineptr = strcpy( Output, OUT_DEF );
ListFile = LST_DEF;
CurrentPage = 0;

if ( argc<2 )
{
printf("FORMAT: %s <option ...> file <file ...>\n\n", argv[
]);
printf("option:\n");
printf(" -lxxx = set lines per page (%d)\n", LinesPerPage
);
printf(" -txx = set TAB size (%d)\n", TABSize );
printf(" -cxxx = set number of columns (%d)\n", Columns )

if (ShowNumber) Text = "yes";
else Text = "no";
printf(" -n = show line numbers (%s)\n", Text );
printf(" -oout = cause output to go to 'out' (%s)\n",
Output );

if (ListFile) Text = "yes";
else Text = "no";
printf(" -f = use 'file' for listfile (%s)\n", Text );
}
else
{
for ( NextArg=1 ; NextArg < argc ; NextArg++ )
{
if ( *argv[ NextArg ] == '-' )
{
ProcessOptions( argv[ NextArg ], Output, &ListFile );
}
else
{
printer = fopen( Output, "a" );
if ( printer == 0 )
{
printf("Can't open %s for output!\n", Output );
}
else
{
PrintLines = LinesPerPage - (HEADER + TRAILER);
if (!ListFile)
{
PrintFile( printer, argv[ NextArg ], PrintLines );
}
else
{
list = fopen( argv[ NextArg ], "r" );
if ( list == 0 )
{
printf("Can't open list file: %s.\n", argv[ NextArg
]);
}
else
{
while ( fgets( FileName, MAXFILE, list ) != 0 )
{
if ( FileName[0] != ';' )
{

```



```

        FileName[ strlen( FileName )-1 ] = '\0';
        PrintFile( printer, FileName, PrintLines );
    }
    fclose( list );
}
fclose( printer );
}
/* end-for */
}

/*****
|          Process Options          |
+******/

ProcessOptions( Option, Output, ListFile )

char Option[];
char Output[];
BOOL *ListFile;

{
    extern int Columns;
    extern int LinesPerPage;
    extern BOOL ShowNumber;
    extern int TABSize;

    char *lineptr;
    char *strcpy();

    switch ( Option[ 1 ] )
    {
        case 'l':
            LinesPerPage = atoi( &Option[2] );
            if (LinesPerPage < LPP_MIN)
            {
                LinesPerPage = LPP_DEF;
                printf("Invalid lines per page. Changed to
%d.\n",LinesPerPage);
            }
            break;

        case 't':
            TABSize = atoi( &Option[2] );
            if (TABSize < TAB_MIN || TABSize > TAB_MAX)
            {
                TABSize = TAB_DEF;
                printf("Invalid TAB size. Changed to
%d.\n",TABSize);
            }
            break;

        case 'c':
            Columns = atoi( &Option[2] );
            if (Columns < COL_MIN || Columns > COL_MAX)
            {
                Columns = COL_DEF;
                printf( "Invalid column size. Changed to %d\n",
Columns );
            }
            break;

        case 'n':
            ShowNumber = TRUE;
            break;

        case 'o':
            if (strlen( Option ) > 2)
            {
                lineptr = strcpy( Output, &Option[2] );
            }
            else
            {
                printf("Output file/device not specified. Option
ignored\n");
            }
            break;

        case 'f':

```



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```

*ListFile = TRUE;
break;

default:
    printf("Invalid option: %s.\n", Option );
}

/*****
|          Print File          |
+******/

PrintFile( printer, FileName, PrintLines )

FILE *printer;
char *FileName;
int PrintLines;

{
    extern int Columns;
    extern int LinesPerPage;
    extern BOOL ShowNumber;
    extern int TABSize;

    int CurrentLine;
    char *fgets();
    char *line;
    int LineNumber;
    char *lineptr;
    FILE *list;
    static char NewLine[ MAXCHAR ];
    BOOL NewPage;
    static char SourceLine[ MAXCHAR ];
    char *strcpy();
    BOOL WrapAround;
    int x;

    list = fopen( FileName, "r" );
    if ( list == 0 )

```


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86 *Amazing Computing V5.5* ©1990


```

    }

    time( &clocktime );
    if ( clocktime == -1 )
    {
        fprintf( printer, NOTMFORMAT, CurrentPage);
    }
    else
    {
        CTime = gmtime( &clocktime );
        if ( CTime == 0 )
        {
            fprintf( printer, NOTMFORMAT, CurrentPage);
        }
        else
        {
            Month = CTime->tm_mon + 1;
            fprintf( printer, TIMEFORMAT, Month, CTime->tm_mday,
                CTime->tm_year, CTime->tm_hour, CTime->tm_min,
                CTime->tm_sec, CurrentPage );
        }
    }
}

/*=====+
| Process Wrap-around
+=====*/

ProcessWrapAround( printer, SourceLine, WrapAround )

FILE *printer;
char SourceLine[];
int *WrapAround;

{
    extern int Columns;
    extern BOOL ShowNumber;

    static int FirstChar;

    char *lineptr;
    static char NewLine [ MAXCHAR ];
    char *strcpy();
    char *strncpy();
    int y;

    for ( y=0; y<Columns-R_ARW_SIZE ;y++ )
    {
        fputc( SourceLine[ y ], printer );
    }
    fprintf( printer, R_ARW_TEXT );

    if ( *WrapAround != TRUE )
    {
        if ( ShowNumber )
        {
            y = LINESPACE;
        }
        else
        {
            y = 0;
        }
        FirstChar = -1;
        while ( y<Columns-(L_ARW_SIZE+R_ARW_SIZE) && FirstChar ==
-1)
        {
            if ( SourceLine[ y ] != ' ' )
            {
                FirstChar = y;
            }
            else
            {
                y = y + 1;
            }
        }
    }
}

```

```

    for ( y=0 ; y<FirstChar ; y=y+1 )
    {
        NewLine[ y ] = ' ';
    }
    lineptr = strncpy( &NewLine[ y ], L_ARW_TEXT, L_ARW_SIZE );
    lineptr = strcpy( &NewLine[ y+L_ARW_SIZE ], &SourceLine[
Columns-L_ARW_SIZE ] );
    lineptr = strcpy( SourceLine, NewLine );
    *WrapAround = TRUE;
}

/*=====+
| Convert TAB to space
+=====*/

ConvertTABtoSpace( SourceLine )

char SourceLine[];

{
    extern BOOL ShowNumber;
    extern int TABSize;

    int FromChar;
    char *lineptr;
    int LineOffset;
    static char NewLine[ MAXCHAR ];
    int Spaces;
    char *strcpy();
    int ToChar;
    int x;

    if ( TABSize > 0 )
    {
        if ( ShowNumber )
        {
            LineOffset = LINESPACE;
        }
        else
        {
            LineOffset = 0;
        }
    }
    /*=====+
    | Perform Conversion
    +=====*/

    ToChar = 0;
    for ( FromChar=0 ; FromChar <= strlen( SourceLine ) ;
FromChar++ )
    {
        if ( SourceLine[ FromChar ] == TAB )
        {
            Spaces = TABSize - ( (ToChar-LineOffset) % TABSize );
            for ( x=0 ; x < Spaces ; x++ )
            {
                NewLine[ ToChar ] = SPACE;
                ToChar = ToChar + 1;
            }
        }
        else
        {
            NewLine[ ToChar ] = SourceLine[ FromChar ];
            ToChar = ToChar + 1;
        }
    }

    lineptr = strcpy( SourceLine, NewLine );
}

```

**Please note that a full version of this listing, (i.e., complete with documentation), is available on AC disk #9.*

•AC•

CONCLUSION

We now have a way to control AC-operated appliances from our beloved computer. This is one step toward the "automated house". As we mentioned earlier, we can use the Amiga to program a sequence of events, as an intelligent timer or just as a remote controller. All this can be done with simple BASIC programs. With a little programming ingenuity, you can modify the code in Listing One and implement various functions, which I intend to do in the near future...

In the meantime, if you want to build a prototype, I can provide the bare PCB (with no components) for \$20 US or \$24 CDN, including postage. I retain author's rights on the actual PCB layout and the design. For those who hate to shop for ICs, I can also provide the full set (O1 to O5, U1 to U5) for \$18 US or \$21 CDN (this price does not include the PCB).

Parts List

Qty	Part Reference	Description
5	R1 to R5	680 ohm 1/4 W resistor
5	R6 to R10	68 Kohm 1/resistor
4	C1, C2, C4, C5	0.1 uF ceramic capacitor
1	C3	10 uF, 25V tantalum capacitor
5	O1 to O5	4N35 opto-coupler or equiv. (100% transfer gain or better Motorola, Texas Instruments ...)
1	U1	74HC174 or 74LS174 (see below)
1	U2	74HC04 or 74LS04 (see below)
1	U3	CD4001B Quad NOR gate CMOS
1	U4	CD4529B Dual CMOS multiplexer
1	U5	CD4051B 8-to-1 CMOS multiplexer
1	V1	MC7912C 12 volt negative regulator (Motorola, Nat. Semiconductor...)
2	J1, J2 eq.)	26 pins header (AP products or eq.)
2	J3, J4	26 pins flat connector for header above (AP products, TB/Ansley)
1	J5	DB25 connector, for flat cable Male for A500 and A2000 Female for A1000

Miscellaneous

26 conductors flat cable, 2 X 18 in. length

1 utility box, 6" by 3 1/4" (Radio-Shack)

Socket for U1 to U5

Plug 'n Power transmitter (Radio Shack # 61-2677)

Plug 'n Power receivers (Radio Shack # 61-268x; x=1, 2, 3 or 4)

Two 9 Volt batteries, for testing purpose only

Note: To minimize power consumption on the Amiga side, I strongly recommend using 74HC parts, which work better under limited power supplies (20 mA on parallel port). You may want to try 74LS parts but they will operate outside their guaranteed working range, depending on your Amiga. U1 to U5 are manufactured by National Semiconductor, Texas Instruments, Motorola.

Listing One

```

*****
** PnP test software
** Written by: Andre Theberge, July 26th 1989
**
** This code is public domain; you are free to
** change it to your liking. It is used to
** test the operation of the hardware interfacing
** a Plug 'n power (R) transmitter to the Amiga.
** Please read the article for more info.
*****

This program establish communication with the PnP
transmitter and prompt for a user command:

Command format : UNIT n <key> (spacing is important)
                  or <key>

...where n is a number from 1 to 8 (receiver number)
<key> is either ON, OFF, BRIGHT, DIM, ALLON, ALLOFF

1 REM Program starts here
Variables declaration

bas6=125749776 : 'Base address of PRB
toff=0 : 'Code to release pushbutton
delay=1000 : 'Pushbutton delay time

Initialize printer port

POKE bas6+512,255 : 'Printer port as output
POKE bas6,0 : 'All 00

Main loop
10 PRINT "Command> "; : 'Issue prompt
INPUT c$ : 'Waiting for command
GOSUB 1000 : 'Go decode command
mask=128:GOSUB 2000 : 'Issue command to PnP
GOTO 10 : 'Go execute next one

Subroutines
1000 REM Decode instruction; look for keywords

Input : c$ -> command string typed by operator

For commands with unit #: decode it and send key data to
PnP transmitter

UNIT 1 => ky=64 UNIT 5 => ky=68
UNIT 2 => ky=65 UNIT 6 => ky=69
UNIT 3 => ky=66 UNIT 7 => ky=70
UNIT 4 => ky=67 UNIT 8 => ky=71

IF LEFT$(c$,4)="UNIT" OR LEFT$(c$,4)="unit" THEN
ky=ASC(MID$(c$,6,1))-49 : 'Compute key equiv.
mask=64:GOSUB 2000 : 'Select module #
FOR i=1 TO delay/2:NEXT i : 'Wait a bit
IF LEN(c$)>8 THEN
c$=MID$(c$,8,LEN(c$)-7) : 'Point to next command
ELSE
c$="" : 'no other command
END IF
END IF

Decode command; put keycode in ky

IF c$="ALLOFF" OR c$="alloff" THEN ky=2: RETURN
IF c$="ALLON" OR c$="allon" THEN ky=3: RETURN
IF c$="DIM" OR c$="dim" THEN ky=4: RETURN
IF c$="BRIGHT" OR c$="bright" THEN ky=5: RETURN
IF c$="OFF" OR c$="off" THEN ky=6: RETURN
IF c$="ON" OR c$="on" THEN ky=7: RETURN

IF c$="" THEN ky=0:RETURN : 'No command

If here, unrecognized command; give error message

PRINT "**** Invalid input, try again":ky=0:RETURN

2000 REM Emulate key action for plug'n power module

Inputs : ky -> code on D0-D2 lines to select switch #
mask -> enable D6 (mask=64) or D7 (mask=128)
and emulate key depressed

POKE bas6,ky: FOR i=1 TO 10:NEXT i : 'Set up key matrix
POKE bas6,ky+mask : 'Key is pressed
FOR i=1 TO delay:NEXT i : '...keep it a while
POKE bas6,ky: FOR i=1 TO 10:NEXT i : '...release
POKE bas6,toff : 'Clear matrix
RETURN

```


BLOCKOUT

Do you like to solve puzzles? Do you remember the Soma cube, a large cube made up of several pieces which you took apart and were supposed to put back together? Do you like Tetris? If you answered yes to any of these questions, then you may be interested in a new game called BLOCKOUT.

Blockout is a three dimensional puzzle game, very similar to Tetris. Your goal is to drop 3D pieces into a pit, forming continuous layers as you go along. Whenever you form a layer, it disappears, thus deepening the pit once again. The game ends when the pieces reach the top of the pit.

The game is provided on a single, copyable disk. To start, you place the disk in the drive at the Workbench prompt. The game loads a brief animation accompanied by music (which can be bypassed by hitting any key once it's started), and then asks you to identify the color of part of one of the playing pieces. To do this, you look up the piece's number in a table provided on the inside of the front and back covers of the manual. When you have found the piece, you then identify the part highlighted and select the appropriate color from the selection on the screen. A color key is provided on the back cover of the manual. Once you have gotten through this simple but effective copy protection, you're ready to start the game.

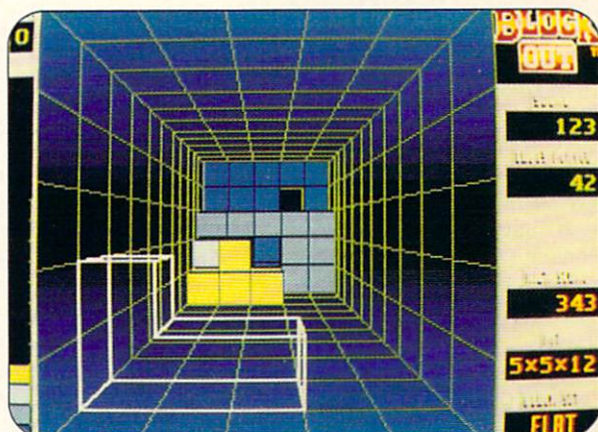
From the Main menu, you can choose to start a new game, choose the game parameters (choose setup), practice placing pieces (a wise idea to start), view a demonstration, ask for help, or quit the game. The bottom of the screen tells you the currently selected parameters. The choose setup screen allows you to choose 3 preset scenarios, or make up your own. There are three blocksets available - Flat (Easy), Basic (Medium), and Extended (Hard). The

Reviews by Miguel Mulet

extended pieces include up to 5 squares, and get pretty complicated to fit into the puzzle. You can select how quickly the pieces rotate, but this doesn't effect your score. The player can also select the length, width, and depth of the playing area, if desired.

Once you've selected the game you wish to play, you are taken to a screen which selects which level you'd like to start on. The larger the number you select, the faster the pieces fall (but you get more points this way, too). After the level is selected, the game screen appears and you're ready to play. The left side of the screen reveals what level you're on, and below this is a "depth" gauge. This gauge shows you what color the pieces are at each depth of the pit.

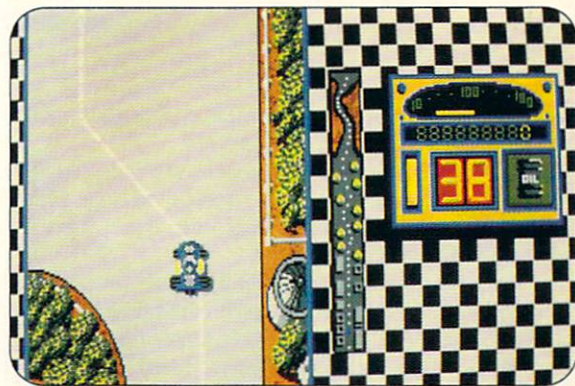
The playing screen for BLOCKOUT



TURBO

Have you ever been driving home from work, wishing you could blast away at those slow pokes in front of you? Or perhaps you've wanted to drop oil from the back of your car to cause that tailgater with his high beams on to drop from sight? Maybe you just long to wreak havoc as you drive your specially-designed sports car through the countryside. If any of these ambitions lurk in the depths of your mind, Turbo may be your fulfillment.

From the depths of vaporware comes Turbo, the long-awaited addition to Microillusions' One to One Series™. In Turbo, you race against death in your modified sports car, hoping to reach the finish line before numerous opponents on the road who are bent on your destruction. You can maneuver your car using a joystick, pushing forward to accelerate, backward to brake, and left or right to steer. In the one player game, your goal is to reach the finish line in the time allotted, while amassing as many points as possible by destroying fellow racers. The race takes you through the city, countryside, and desert. Along the way, you can pick up accessories which will help you. To acquire these devices, all you have to do is run over them. You can pick up wide tires to increase your speed, or spikes which help you push aside the police, as well as other racers. Unfortunately, these devices are mutually exclusive; you can have either wide tires or spikes, but not both. As for offensive weapons, you have your choice of one of the following: oil, hand grenades, or missiles. Oil can be dropped with a press of the fire button, and causes the vehicles behind you to slip and slide to their destruction. The hand grenades are useful for obliterating vehicles close to you, while missiles destroy targets further away.



Single player mode allows viewing of all dashboard instruments in TURBO

The driver scores points by destroying the enemy in any way possible—whether by running them off the road, or throwing a grenade in their lap. Of course, your opponents are trying to do the same thing to you. The only difference is that as soon as you succeed in destroying a fellow racer, the police come after you (for some reason your opponents don't have to contend with the police). Once the police are after you (you can hear their sirens and see your radar detector flash), you only have two choices, and your choice depends on what equipment you have. If you have spikes, you can run them off the road. If you don't, then you should probably pull over—otherwise the police will run you off the road, causing you to crash! Oh, by the way, while running over pedes-

The game "pit" is in the center, and to the right of this are the vital statistics - Score, Pieces played, High Score, Pit Size, and the type of blocks you're playing with.

As the game begins, the pieces are revealed as "wire-frame" images. To rotate the pieces, you use either the Q,W, and E keys or the A, S, and D keys. (The former rotates pieces counterclockwise, while the latter rotates them clockwise). These keys rotate the piece along the X,Y, and Z axes (Better get out the old geometry book!) Those keys only rotate the piece. To move the piece, you use either the mouse or the numeric keypad. The 4 key moves the piece to the left, the 6 key to the right, the 8 key up, and the 2 key down. The other keys move the piece diagonally in the corresponding direction. (Surprisingly enough, I found the keypad easier to use than the mouse.) Once you have positioned the piece, you can drop the piece by hitting the space bar. Once the piece is in place, it "solidifies" in the color of the layer at which it's resting.

If you're thinking that it seems complicated, you're partially right. It takes a few minutes to get used to things, but not very long. Once you get the hang of it, you find yourself maneuvering the pieces fairly well. The hard part is finding ways to place them so that you can form even layers. When you do form a layer, a "gong" sounds and the layer disappears, with all other pieces dropping a level in their relative positions. You earn points by dropping pieces from higher levels, and by eliminating layers of pieces. If you can eliminate more than one layer at a time, your score swells even higher. The only other hitch is that as the game progresses, the pieces begin to fall faster and faster, leaving you little time to maneuver.

The game is very well done. Graphics are crisp and neat, and scrolling of the game pieces is smooth. Things slow a little with the extended block set, but it really doesn't effect game play. The programmers even remembered to include a pause button (the P key),

so that game play can be stopped for such amenities as dinner. The disk is not copy protected, and the manual encourages you to make a backup. This is essential as the game stores several high score tables to disk (one high score table for each of the predefined games, and one high score table for EACH of your custom setups). Besides the "gong" sound which plays when a layer is completed, there is no soundtrack during game play. I felt that this would have been a nice addition (maybe I just got used to hearing a soundtrack during Tetris). The manual is well written, although it is a "one size fits all" - the instructions cover the Amiga and all other computers for which the game is written.

BLOCKOUT also has many other nice features. The demonstration mode, allows you to visualize how to maneuver the pieces. The practice mode allows you to do just that - practice the controls without worrying about the game speeding up on you. There is even a help screen, which gives you a quick refresher course on all the available commands.

Overall, I enjoyed (and enjoy) playing BLOCKOUT. It certainly is a challenging game, even more so than Tetris. Luckily, the game is not quite as addicting as Tetris (otherwise this review would never have been written). If you like Tetris, you'll probably like BLOCKOUT. And if you want to exercise the three dimensional part of your mind, you'll get a good workout.

BLOCKOUT
Produced by PZK Co.
Distributed by California Dreams
780 Montague Expressway #403
San Jose, CA 95131
(408) 435-1445
Price: \$39.95
Inquiry #228

trians (who faithfully remain in the crosswalks) causes them to scream, they are not worth any points!

In the two player mode, the goal is to make it to the finish line before your human opponent. There is no time limit in the two player mode, and points are unimportant as well, because whoever reaches the finish line first wins.

Game graphics are surprisingly good. The player's view is an overhead view of the race track, with the full race course shown in miniature in the middle of the screen. Your position is marked by a small blue or red dot, depending on whether you are playing the one or two player game. The graphics are fairly good for the cars, but the countryside and desert could use a little work. I had trouble distinguishing when I had actually made it into the desert. The sound effects are digitized stereo sound reminiscent of the sounds in Fire Power (another Microillusions game). Overall, the sounds are very realistic, including the screams of the pedestrians you run over.

Turbo does not include written documentation, aside from some quick start instructions on a single, half-sheet piece of paper. This document informs the user that, despite the pictures on the back, Turbo DOES NOT SUPPORT MODEM PLAY. To Microillusions' credit, the sticker on the front of the game which lists hardware requirements also mentions this fact. Also, Microillusions recommends disconnecting all external disk drives, if playing the game on a 512K, one and two player games computer work fine. The instructions to the game are available on the disk by selecting

this option at the title screen. The "online" instructions are understandable, but someone wasn't watching their grammar when they wrote them.

Although the game has fairly good sound and graphics, Turbo failed to keep my attention. No matter how hard I tried during a single player game, I could not reach the finish line, even though I had never been destroyed or stopped by the police. Thus, the only thing I could do to entertain myself was destroy fellow opponents, which was very easy to do and became very tedious. The two player game was a little more fun, probably because I was playing against another person. The problem with the two player version is that it doesn't matter how many points you score, the only goal is to finish first. Thus, Turbo becomes a pure race game, and unfortunately, there are several other products that accomplish this task better.

Turbo
Produced by Silent Software
Distributed by Microillusions
P.O. Box 3475
Granada Hills, CA 91344
Price: \$29.95
Inquiry #226

Correction

In John Iovine's article "Bio-feedback/Lie Detector Device", which appeared in the April issue of *Amazing Computing*TM (V5.4), the listings that were to accompany the article were inadvertently omitted. Our apologies to Mr. Iovine and to our readers for any inconvenience this error may have caused. The program listings are as follows:

Listing One

```
REM      Print Digital Number
REM      Program #1
REM      Press "s" to stop program

DDR = 12575489% ' cia #2 port b
dr  = 12574977% ' cia #2 port b
sdr = 12573696% ' cia #1 serial data register

' set up DDR
POKE(DDR),1
start:
FOR t = 0 to 7
POKE dr,1 :POKE dr,0
NEXT t
a$ = INKEY$
IF a$ = "s" THEN END
CLS: gsr = PEEK(sdr)
LOCATE 12,35:PRINT gsr
GOTO start
```

Listing Two

```
REM      Linear Graph
REM      Program #2
REM      Press "s" to stop program

DDR = 12575489% ' cia #2 port b
dr  = 12574977% ' cia #2 port b
sdr = 12573696% ' cia #1 serial data register

' set DDR
POKE(DDR),1
start:
x1 = 0 : y1 = 0
FOR h = 0 TO 639
FOR t = 0 TO 7
POKE dr,1 :POKE dr,0
NEXT t
a$ = INKEY$
IF a$ = "s" THEN END
gsr = PEEK(sdr)
IF gsr < 1.38 THEN gsr = 1.38
a = 186 - gsr/1.38
LINE (x1,y1)-(h,a)
x1 = h:y1 = a
NEXT h
CLS
GOTO start
```

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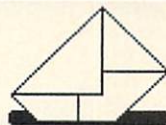
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The Fred Fish Collection

Due to the increasing size of the Fred Fish Collection, only the latest disks are represented here. For a complete list of all AC, AMICUS, and Fred Fish Disks, cataloged and cross-referenced for your convenience, please consult the current *AC's Guide To The Commodore Amiga* available at your local Amazing Dealer.

Fred Fish Disk 293

ClockDJ A utility which combines a clock, mouse accelerator, screen blanker, window manipulator, function keys, and macros into a single program, written in assembly language for maximum efficiency. Includes an AREXX port. V4.07, binary only. By: David Jenkins

CrcLists Complete CRC check files for disks 001-292 using the brik program. These were made directly from my master disks. I have switched to brik, from the crc program used to make the lists on disks 133, 146, and 173, because it has more features and because source is available. Update to FF233. By: Fred Fish

Fred Fish Disk 294

DNet A link protocol that provides essentially an unlimited number of reliable connections between processes on two machines, where each end of the link can be either an Amiga or a Unix (BSD4.3) machine. Works on the Amiga with any EXEC device that looks like the serial device. Works on UNIX with tty and socket devices. Achieves better than 95% average throughput on file transfers. V2.10.13, an update to FF220. Includes sources for both the Amiga and Unix versions. Author: Matt Dillon

FmsDisk A file based partition simulator, useful for creating a floppy-like partition on your hard disk (so you can diskcopy to a floppy) without actually having to create a special partition for it. Also useful for testing new filesystems and such. Supports up to 32 units, with either the old filesystem or the new fast filesystem. Includes source. Author: Matt Dillon

Fred Fish Disk 295

GnuGrep The grep program from the GNU project. Replaces greplrep, egrep, and bmgrep. Currently does not expand Amiga style wildcards, so if you wish to scan multiple files you will need to use it with a shell that does this for you. This is version 1.5, an update to version 1.3 on disk 204. Includes source. Author: Many (see README file)

Lhwrap A program which will read tracks directly from your floppy disk, compress them using adaptive Huffman encoding, and output them to a file. The resulting file can be used by lhwrap to reconstruct an image of the original disk. This is version 1.03 and includes source. Author: Jonathan Forbes

Fred Fish Disk 296

MandelMountains A program that renders three-dimensional images of blimps of the Mandelbrot set. Includes several example images. Version 1.1, shareware, binary only. Author: Mathias Ortmann

Fred Fish Disk 297

Comal Demo of AmigaCOMAL (missing only SAVE), an incremental p-code compiler from Denmark. COMAL is a language with the design goal of combining the modern structured approach of Pascal with the ease of use and interactivity of BASIC. There are versions of COMAL for IBM, VAX, CPM, C-64, Amiga and various European operating systems. Includes a complete turtle graphics package. Is perfect for education yet powerful enough for applications programming. Version 2.0, binary only. Author: Svend Dagaard Pedersen Freddy Dan Dalgas Kristiansen

Patch A part of the very useful UNIX utility which applies context diffs to text files to automatically update them. This is a port of version 2.0.1.6 (patch level 12), which Eric has dubbed Amiga version 1.0. It is an update to an earlier version on disk 129. Includes source. Author: Larry Wall, Amiga port by Eric Green

Fred Fish Disk 297

Clean A small program written in assembly code, to be used in conjunction with a cleaning disk, to clean your floppy drive heads. Version 1.0, includes source. Author: Dan Burris

DevKit A collection of C and AREXX language programs to facilitate the software development process. With DevKit, you can launch your compiler from within your editor, have the cursor positioned on your errors, look up the autocode page for any Amiga function at a single keystroke, find a system structure within the code files, or find any function in the code you are writing. Version 1.2, includes source. Author: Peter Chernia

Fred Fish Disk 298

Elements Very nice interactive display of the the Periodic Table of Elements. Can display a large amount of pertinent data about a selected element along with a good deal of general and miscellaneous info. V 1.3, update to FF253. It adds a non-interface mode and extend selection of two elements. Binary only, shareware. Author: Paul Thomas Miller

Hypno

A "bouncing polygons" type program like Mackie, LineArt, and Bezier. Includes source in C. Author: Markus Schmidt

Jed

A nicely done, intuition-based editor that is quite user-friendly. Features word-wrap, auto-indent, newcli, alt buffer, split-window, keyboard macro, help, printing, and more. V1.1, Update to FF180. Shareware, binary only. Author: Dan Burris

SuperMenu

An information display system you can use to quickly and easily display text files (and sections of text files) with the press of a button. Version 1.62, shareware, binary only. Author: Paul Thomas Miller

WriteIcon

Sample code that creates an icon using a compiled-in image, the source of which can be created with Icon2C on FF56. V1.0, includes source in C. By: Dan Burris

Fred Fish Disk 298

BBChampion This is BootBlockChampionIII, a very nicely done program that allows you to load, save, and analyze any bootblock. V3.21, an update to FF244. New features include checks for five different LAMER viruses and some other enhancements. Binary only. Author: Roger Fischlin

DClock

A "Dumb Clock" utility that displays the date and time in the Workbench screen title bar. Uses only about 2 percent of the CPU time and about 10Kb of memory. Also has an alarm clock feature and audible beep for programs that call DisplayBeep. Version 1.5, includes source. Author: Olaf Barthel

Fenster

A program which can operate on windows owned by another program, to close them, change their size, refresh gadgets, move the window to the background, etc. V2.0, an update to FF245. Includes source. Author: Roger Fischlin

FileMaster

A file editor like NewZap or FedUp, which allows you to manipulate bytes of a file. You may also change the file size or execute a patch. Version 1.11, includes source. Author: Roger Fischlin

Fred Fish Disk 299

Hangman A simple hangman program similar to one seen on some UNIX machines. Currently runs only from CLI. Includes source in C. Author: Gary Brant

Rxil An AREXX interface library that makes it easy for programs to implement a complete, robust AREXX interface with minimal effort. Version 1.0, includes source. Author: Don Meyer

SceneGenDemo

Demo of a program called Scene Generator, that generates very realistic looking landscapes. This program is an enhanced, low cost commercial version, of the Scenery program included on disk 155. This is version 2.03, binary only. Author: Brett Casebolt

Yacc

This is a port of Berkeley Yacc for the Amiga. This Yacc has been made as compatible as possible with the AT&T Yacc, and is completely public domain. Note that it is NOT the so-called Deous Yacc, which is/was simply a repackaging of the proprietary AT&T Yacc. Amiga version 1.0a, includes source. Author: Bob Corbett, Amiga port by Eric Green

Fred Fish Disk 300

SuperEcho A neat program to be used with Perfect Sound-like audio digitizers that generates LIVE audio effects, including Echoes, Deep Voice, Squeaky Voice. Many People, M-M-Max Headroom and much more. Binary only. Author: Kevin Kelm

TACL

An adventure player for games written with The Adventure Construction Language, a commercial computer language. Includes two sample games; one is text-only and the other is text-graphic. Binary only, plus the TACL source code that was used to write the graphic adventure. Author: Kevin Kelm and Rhett Ridewald

TitleGen

A simple script language program for generating vertically crawling title sequences in any font and up to 500 lines long. Good for video production. Version 1.5, binary only. Author: Kevin Kelm

XenoZap

A program that recursively descends into directories, disabling the Xeno virus in all executable files that it finds. Version 1.0, includes source in Module-2. Author: Kevin Kelm

Fred Fish Disk 301

Aquarium A program for searching through a special database containing information about the contents of the library, in order to find programs that match a specified list of conditions. Includes a database of disks 1-300, and a program to add the contents of future disks to the database. Binary only. Author: B. Lennart Olsson

IFLib

A ready-to-use library to perform various manipulations on IFF files. Includes a sample IFF viewer and a utility to save the front screen as an IFF file. This is version 1.6.1, an update to version 1.5.3 on disk 173, and includes a couple of bug fixes and some new features. Binary only. Author: Christian A. Weber

UeditUpdate

This is a partial update to the 2.5d version of Uedit on disk 286. It includes only the UES executable, which has had patches d1 through d4 applied. Disk 286 is still needed for a complete Uedit shareware distribution. Binary only. Author: Rick Stiles

Fred Fish Disk 302

Chop A program which uses a hotkey to chop a displayed screen down to a temporary maximum of 4 planes in lo-res or 2 planes in hi-res, allowing the processor full speed access to chip memory. Only the displayed screen is affected, the program painting the screen

continues to work with the full color palette.

Unchoping the screen puts everything back to normal. Version 1.0, binary only. Author: Nico Francois

DiskTalk

A cute little program, like "munchie" on disk 137, which plays digitized sound samples when you insert or remove a floppy disk. Samples are saved as IFF sound files. Version 1.0, binary only. Author: Nico Francois

MiscUtils

Some small sound and screen hacks. Includes source in C. Author: Jorrit Tyberghein

PPMore

Another "more" like utility. This one reads text files that have been crunched with PowerPacker, thus saving space at the slight expense of some time to uncrunch the text. Version 1.3, binary only. Author: Nico Francois

ProgUtils

Some miscellaneous programming utilities and examples. Includes source in assembly code. Author: Jorrit Tyberghein

QuickHelp

A utility that helps you make and display your own help files for commands. Disk space usage is minimized by using PowerPacker to crunch the help files. Version 1.2, binary only. Author: Jorrit Tyberghein

RollOn

A "Soko-Ban" like shareware game, submitted by the author. Includes both English and German versions, a level editor, and digitized sounds. This is version 1.1, binary only. Author: Tobias Eckert

Selector

A program that helps you assemble programs on a boot disk and start them in a user friendly way. Version 2.5, binary only. Author: Nico Francois

TurbMandel

A fast mandelbrot program, written in a mix of C and assembly language. You can select between using floating point or integer calculation. Other features include a full intuition interface, cycling capabilities, extensive color control, a user definable iteration depth, fully implemented zoom, a 3-D display mode, support for extra halftone as well as interface and hires, IFF load and save, accuracy selections, and more. Version 1.0, includes source in assembly and C. Author: Marivoet Philip

Fred Fish Disk 303

CPM A program to compute mandelbrot via the Continuous Potential Method, as described in the book "The Science of Fractal Images" by H. O. Peitgen and D. Saupe. It is used to make 3-dimensional pictures of the mandelbrot set. This is a batch mode type program so several images can be generated, one after the other, without any human interaction. With source. By: Lars Clausen

DEM

A program to compute mandelbrot via the Distance Estimator Method, as described in the book "The Science of Fractal Images" by H. O. Peitgen and D. Saupe. It is used to make high resolution black-and-white images. This is a batch mode type program so several images can be generated, one after the other, without any human interaction. Includes source. Author: Lars Clausen

Demon

This program implements the Demons cellular automaton as described in the August, 1989, issue of Scientific American. Using extremely simple rules it exhibits rather complex behaviour. Includes source. Author: Lars Clausen

FixIcons

A program to scan through all files in a given volume or directory, looking for project icons and changing their default tools according to instructions given in a script file. Version 1.2, includes source. Author: Lars Clausen

IceFrac

A fractal generator using the Diffusion Limited Aggregation algorithm, as described in the book "The Beauty of Fractal Images". This is version 2.1 and includes source. Author: Lars Clausen

Rocket

Another program in the long tradition of screen hacks. This one zeroes in on your mouse pointer. Binary only. Author: Lars Clausen

ScreenZap

A utility that forcibly removes screens and windows from your system. Useful to get rid of zombie screens or windows that have been left around by aborted or buggy programs. This is version 2.3 and includes source. Author: Lars Clausen

SnowFall

Another program in the long tradition of screen hacks for the Amiga. Watch the snow fall, get blown around by the wind, and collect in realistic heaps. Includes source. Author: Lars Clausen

Fred Fish Disk 304

Circles A circles pattern generator, reminiscent of one of the early Amiga demos. Version 1.1, includes source in C. Author: Joel Swank

DocSplit

A program to split the 1.3 autocode files into individual subroutine files. One file is created for each subroutine, with the name created by appending ".doc" to the subroutine name. Version 1.0, includes source. Author: Joel Swank

Gears

A program to calculate and display the gears of a multispeed bicycle. Works for bicycles with 3 to 21 gear combinations. Version 1.1, includes source. Author: Joel Swank

IRA

Allows easy calculation of future values of investment. Enter the beginning investment value, annual percentage rate, annual deposit amount, and number of years, to compute the future value. Version 2.0, includes source. Author: Joel Swank

Lines

A color line pattern generator, adapted from Mackie. Version 1.1, includes source. By: Joel Swank

Mean18

2 custom golf courses for Mean 18. By: Joel Swank

Multic

Formats a single column of input into multiple side by side columns. Includes source. By: Joel Swank

PageCnt

Counts and displays the number of form feeds in a file, along with the length of the longest line. Version 1.0, includes source. Author: Joel Swank

Skel

A skeleton workbench application that makes writing workbench programs easier. Provides routines for main, initialization and termination, gadget and menu handling, argument processing, help window, about requester, etc. Version 1, includes source. Author: Joel Swank

SuperRetLab

Prints return address labels 3-up on single-wide 3.5 inch by 7.125 inch label stock. Can print up to 5 lines per label. Version 1.1, includes source. Author: Joel Swank

Verily

Walks a directory hierarchy reading all files, reporting any files that can't be entirely read. Version 1.2, includes source. Author: Joel Swank

Fred Fish Disk 305

Fenster A program which can operate on windows owned by another program, to close them, change their size, refresh gadgets, move the window to the background, etc. This is version 2.1, an update to version 2.0 on disk 298. Includes source. Author: Roger Fischlin

Lhwrap

A program which will read tracks directly from your floppy disk, compress them using adaptive Huffman encoding, and output them to a file. The resulting file can be used by lhwrap to reconstruct an image of the original disk. This is version 1.20, an update to version 1.03 on disk 295. New features include much faster compression/decompression, a 32-bit CRC, and two additional compression methods. Binary only. Author: Jonathan Forbes

Mackie

A versatile C macro-key initiator based on POPCLI with a unique method of "screen-blanking". I won't say more, just try it! This is version 1.4, an update to version 1.3 on disk 267. Includes fixes to work with latest WShell and the new "neve" keyword. Includes source. Author: Tomas Rokicki

Obsess

Obsess-O-Matic is a real-time puzzle game like Tetris where the object is to fit the falling pieces together to form complete horizontal rows. Features such as burning, exploding, and invisible pieces enhance game play. Other features such as a puzzle piece editor are included in the version available directly from the author. This is version 1.0, shareware, binary only. Author: Wayne Phillips

PrFont

Prints a sample of each font from the fonts: directory. Draws one line of each font on a custom hires screen, can be printed. V1.3, with source. By: Joel Swank

Reversi

Plays the classical reversi game on an 8 x 8 square field. Version 2.0, an update to FF245. Includes source in assembly language. Author: Marc Fischlin

SpaceLog

A database containing data for all of the man related space missions of the United States and the Soviet Union that were related to the development of manned space flight, from the beginning of the space age to the present (368 missions), listed in chronological order. Includes an AmigaBASIC program to manipulate the database. V1.54, binary only. By: Gene Heitman

Fred Fish Disk 306

Life A new version of Tomas's Life game. This version includes a new torus option, an option to perform calculations with the processor rather than the blitter, and a couple of other minor changes. Update to FF131, includes source. Author: Tomas Rokicki

RexxPIPlot

A library of C functions useful for scientific plotting on the Amiga. The library is Lattice C compatible. Contour plotting, three dimensional plotting, axis redefinition, log-log plotting and multiple subpages are a few of Plot's features. Plots can be displayed on a monitor or sent to a graphics file for subsequent printing. This is RexxPIPlot version 0.3, an update to Plotlet V1.00 on FF 222. New features include an AREXX interface, support for IFF output, support for PostScript output, support for Preferences, some new functions, bug fixes, and more. With source. By: Tony Richardson, Samuel Paducci, Glenn Lewis & Tomas Rokicki

Tree

A very simple directory tree traversal program, written as an aid to creating zoo archives and disk backups. Options to exclude certain directories or files with specific extensions. With source. By: Tomas Rokicki

Fred Fish Disk 307

DissDemos Demo of Midi Sample Wrench, which provides pro sample editing features for owners of musical samplers. Version 1.1, binary only. Author: Jeff Glatt

FileIO

A disk based shared library to make filename selection easy for load and save routines using an Intuition interface. V 1.5, update to FF257. Now includes the ability to select multiple filenames and fixes some bugs. Binary only. By: R. J. Mical, Jeff Glatt and Jim Fiore

Samp	Documentation and interface library for an IFF FORM "SAMP", 16-bit sampled sound file format. This format allows more than one waveform per octave, and the lengths of different waveforms do not have to be factors of 2. Includes a utility to convert SVX files to SAMP format. Version 1.0, binary only. Author: Jeff Glat	display any part of the date or time using the options in any color desired, and will also make an automatic adjustment of your system clock for Daylight Savings Time so your computer will be one less clock you will ever have to set twice a year for DST. Version 1.15c, includes source. Author: George Kerber	Vectors	A simple program to test how fast the Amiga can draw lines. Includes two versions, 1.0 and 1.1, each of which performs tests slightly differently. Includes source. Author: Gauthier Groult and Jean Michel Forgeas	compactly. Simple IFFs can describe an infinite number of different and interesting fractal displays. Includes a number of displays that the author and others have discovered. Version 1.5, includes source in C. Author: Glen Fuller
Fred Fish Disk 308	FFaq	ChinaChallenge	Fred Fish Disk 317	StarStore	Planets
ScreenShare	A general purpose file requester, designed to be easy to use and fast, with a built-in ARexx port allowing you to use it from ARexx scripts or applications with ARexx ports. V1.0, binary only. By: Jeffrey D. Wahaus	LHarc	StarStore	A program designed for freelance, corporate, and broadcast television. It loads and displays IFF images of any resolution interchangeably from a list file or as inputted directly (i.e. random access). The user may easily skip forward or backward one or more pictures in the list. A "generic" display is always just a few seconds away. The program can be used "on air" with no concern that a pull down menu will suddenly appear in the viewable area. It also provides for a precise cue for changing windows or screens. While the main purpose is to load "news windows" of 1/4 screen size, StarStore can also handle full-sized and overscanned images. Also includes slide show modes and a screen positioning feature. Stillstore is written in the Director language from the Right Answers Group. Version 1.2, binary only. Source available from authors. Author: R. J. (Dick) Bourne and Richard Murray	Turtle
StarBlacker	A screen blinder that replaces your display with a randomly chosen animated starfield. Version 1.0, includes source in Modula-2. Author: Chris Bailey	TrackSalve	Uniq	Unidirs	Whereis
Vlt	VLT is both a VT100 emulator and a Tektronix (4014 plus subset of 4105) emulator, currently in use at SLAC (Stanford Linear Accelerator Center). Although the VT100 part was originally based on Dave Wecker et al.'s VT100, many enhancements were made. Features include use of ARP, an ARexx port, XMODEM 1K/CHC and Kermit protocols, support for additional serial ports, external file transfer protocols (XPR), a "chat" mode, and scrollback/review/history buffer. It comes in two versions, one with Tektronix emulation, and one without. The Tektronix emulation allows saving IFF files, PostScript files, and printing bitmaps to the printer. V4.428, an update to FF257. The major change for this update is a rewrite of the Tektronix emulation to support almost all of the Tektronix 4105 escape sequences. Binary only. By: Willy Langeveld	Fred Fish Disk 313	Fred Fish Disk 318	CNewsBin	Fred Fish Disk 322
Bind	A binding (glue) library builder. Takes a standard ".ld" (function definition) file and generates a binding library for the functions defined in the ".ld" file. V1.2, an update to FF227. Binary only. Author: Bill Barton	UUCP	CNewsBin	This is part 1 of a C News distribution for the Amiga. This part includes all the binary and text files necessary to set up and run C News. Part 2 is available on disk 319 and contains the source. Author: Various, Amiga port by Frank Edwards	Gwin
Csh	Version 4.00a of a csh like shell derived from Matt Dillon's shell, V2.07. Update to FF223. Changes include ARP pattern matching, improved search command, some new commands like "basename", new options, bug fixes, and an ARexx port. By: source. By: Matt Dillon, Steve Drew, Carlo Borro, Cesare Diani	Fred Fish Disk 314	HWarp	A program which will read tracks directly from your floppy disk, compress them using adaptive Huffman encoding, and output them to a file. The resulting file can be used by hwarp to reconstruct an image of the original disk. This version 1.21, an update to version 1.20 on disk 305. Binary only. Author: Jonathan Forbes	LinkSound
SKsh	A ksh-like shell for the Amiga. Some of its features include command substitution, shell functions with parameters, aliases, local variables, local functions, local aliases, powerful control structures and tests, emacs style line editing and history functions, IO redirection, pipes, large variety of built-in commands, Unix style wildcards, Unix style filename conventions, filename completion, and coexistence with scripts from other shells. Very well documented. V1.3, an update to FF291. Binary only. Author: Steve Koren	A68k	PKAZip	The PKWare ZIP tool for the Amiga. Provides functions to create, examine, extract, test, modify, display, and print files which are in the ZIP compressed format Uses a full intuition interface with no GUI support. V1.01, an update to FF311. Binary only. By: PKWARE Inc, Amiga version by Dennis Hoffman	Show
Fred Fish Disk 310	Mon	Zc	WaveMaker	WaveMaker	Fred Fish Disk 323
UUCP	A machine code monitor/debugger program for the Amiga which is re-entrant and can be made resident. This is version 1.24, binary only. Author: Timo Rossi	Drawmap	Xoper	Very comprehensive program to monitor and control system activity. Monitor cpu, memory usage, ports, interrupts, devices. Close windows, screens, show loaded fonts or last gun number. Clean up memory, flush unused libraries, devices, fonts, etc. and a whole bunch more! Spawns its own process. A very handy background task to have loaded. V2.2, an update to FF274. Changes include bug fixes & minor enhancements. With Assembly source. By: Werner Gunther	ColorTools
Fred Fish Disk 311	CRobots	Surf	Fred Fish Disk 319	AHDM	ANSIEd
Echo	A game based on computer programming. Unlike arcade type games which require human input controlling some object, all strategy in CRobots is condensed into a C language program that you design and write, to control a robot whose mission is to seek out, track, and destroy other robots, each running different programs. All robots are equally equipped, and up to four may compete at once. Version 2.1w, binary only, source available from author. Author: Tom Poindexter, Amiga version by David Wright	Formulae	AmigaFax	A text processor with graphics capabilities. Version 1.00, binary only. Author: Michael Must	DiskFree
Fortune	Fortune will randomly display a "fortune" selected from the fortunes file (supplied). The "fortunes" file is easily modified or added to by the user, using any text editor. Fortune provides color and speech by user option. Version 2.04c, includes source. Author: George Kerber	IntuSup	Drawmap	A program for drawing representations of the Earth's surface. Can generate flat maps, mercator maps, globe views and orbital views. V2.0, an update to FF229. Enhancements include dropshadows, user text entry and placement, improved event processing and better looking mouse pointers. With source. By: Bryan Brown	DPFFT
Incr	Incr will easily allow the user to keep a total count of any event run from a batch file. Incr will take a number from a file, increment it by one and display the result. The new count is written back to the file. Version 1.04b, includes source. Author: George Kerber	Life	Mathtrans	A very small library which replaces the mathtrans library distributed by Commodore-Amiga, for those who own an MC68881/82 floating point unit. Calculation speed of some functions is increased up to 15 times. Version 1.1, includes source. Author: Heiner Huckstadt	Mailchk
PKAZip	The PKWare ZIP tool for the Amiga. Provides functions to create, examine, extract, test, modify, display, and print files which are in the ZIP compressed format Uses a full intuition interface with no GUI support. Version 01.00, binary only. Author: PKWARE Inc, Amiga version by Dennis Hoffman	SmartIcon	Fred Fish Disk 320	AmiOmega	Tetris
Udate	Udate is a replacement for the AmigaDOS date command, containing many options similar to the UNIX date command. Udate will allow you to set the date and time via prompts or directly from the command line, will	Udate	AmiOmega	AmiOmega	Fred Fish Disk 325

FAM	A File Access Manager for the Amiga that allows multiple ARExx programs to access a buffered version of a directory in a consistent and serialized manner. It buffers all the names, dates, sizes and so on, for quick access. V1.1, and includes source. Author: Darren New				
FarPrint	Debugging functions for programs which don't have any links to their environment. FarPrint consists of two major parts: a harbour process open to receive and distribute messages and requests, and a set of C functions to be linked into any program wishing to communicate with the FarPrint main process. V1.5, an update to FF281, and adds a shared library as well as linker libraries for both Lattice and Aztec C. Includes source. by: Olaf Barthel				
KeyMacro	A keyboard macro program, configurable via a text file, that also supports hotkey program execution. You can map up to eight functions to each key, including keys such as cursor keys, the return key, etc. Version 1.0, includes source. Author: Olaf Barthel				
LifeCycles	Some sort of biorythm type program. No docs included. V2.0, binary only. Author: Michal Todorovic				
MemGuard	MemGuard is a MemWatch-like program which has been rewritten in assembly language for maximum speed and efficiency. Unlike MemWatch MemGuard does not run as Task in a dummy loop but rather as a low-level interrupt routine which is capable of trapping memory thrashing even before exec might know of it and even while task switching is forbidden. In fact the low-memory area is checked each frame. Virtually no processing time is wasted, the interrupt routine does the check in about half a raster scan line's time. Rall uses some very delicate tricks to let the interrupt routine work with intuition alerts. VIII, binary only. by: Ralf Thanner				
RexxHostLib	This is a shared library package to simplify the ARExx host creation/management procedure. Rexx-message parsing is also included making it possible to control ARExx from programs such as AmigaBASIC (can you imagine AmigaBASIC controlling AmigaTeX?). Includes source. Author: Olaf Barthel				
Fred Fish Disk 326					
CBDump	This is a CLI utility for those who are working with the Amiga's clipboard device. It's sole purpose in life is to dump the current contents of the clipboard to stdout or by redirection to a pipe or a file. Useful for testing and interfacing with programs that do not support the clipboard. Source included. by: Stephen Vermeulen				
DispMod	One of the series of ROBBS (Rexx Object Building Block System) modules by Larry. A display module that only understands ARExx messages. It allows, under program control, display of text and the acceptance of keyboard data. V0.11, includes source. by: Larry Phillips				
Itb	This program converts an icon to an IFF picture (brush) file. It handles both single and alternate image (animated) icons. V1.10 adds a colour palette to the version on FF85. Binary only. By: Stephen Vermeulen				
MicroTerm	A very small, very simple, almost brain-dead terminal program. Primarily useful as an example of how to talk to the console and serial devices. V0.1, includes source. by: Stephen Vermeulen				
NeuralNets	Play with Neural Nets using Hopfield and Hamming algorithms. Binary only. by: Uwe Schaefer				
PopScreen	A small hack to pop a hidden screen to the front from the CLI. This was written to allow the author to use VLTjr with other programs that also use custom screens. Source included. by: Stephen Vermeulen				
Snap	A tool for clipping text or graphics from the screen, using the clipboard device. Snap finds out character coordinates automatically, handles different fonts, keymaps, accented characters, and more. V1.4, an update to FF274. With source. Author: Mikael Karlsson				
VSNap	This is an enhanced version of Snap 1.3, submitted by Steve Vermeulen, which adds the ability to save clipped graphics as IFF FORM ILMB's to the clipboard, so they can be imported to other programs that understand IFF and the clipboard. I have dubbed it VSNap, since the official 1.4 Snap is also included on disk. Includes source. Author: Mikael Karlsson, enhancements by Steve Vermeulen				
Fred Fish Disk 327					
ARTM	ARTM (Amiga Real Time Monitor) displays and controls system activity such as tasks, windows, libraries, devices, resources, ports, residents, interrupts, vectors, memory, mounts, assigns, fonts and hardware. Includes both a PAL and an NTSC version. This is version 1.0, an update to version 0.9 on disk 277. Binary only. Author: Dietmar Jansen and F. J. Mertens				
MM	An implementation of the game Mastermind. In this game you must try to guess a color combination which the amiga sets via a random generator. There are 6 colors which can be set in any combination. Includes source. Author: Dietmar Jansen				
MRBackup	A hard disk backup utility that does a file by file copy to standard AmigaDOS floppy disks. Includes an intuition interface and file compression. This is version 3.4, an update to version 3.3e on disk 279. Binary only. Author: Mark Rintert				
Msh	An Amiga file system handler that handles MSDOS formatted diskettes. You can use files on such disks in almost exactly the same way as you use files on native AmigaDOS disks. This is a fully functional, read/write version, that supports 8, 9, or 10 sector disks of 80 tracks, and should also work on 40 track drives and hard disks with 12 or 16 bit FAT of any dimension the FAT allows. Includes source. Author: Olaf Seibert				
Softfont	Converts portrait soft fonts for HP LaserJet compatible laser printers to landscape format. Includes source. Author: Thomas Lynch				
Fred Fish Disk 328					
AnalysCalc	A full featured system for numerical analysis and reporting. Includes a spreadsheet, graphics programs, documents and facilities for performing many commonly needed functions. Features include an 18000 by 18000 cell spreadsheet using virtual memory, random access to other saved spreadsheet formulas or values, easy save or merge of partial sheets, up to 400 windows on screen,				
Hames	ability to drive any cell from external macros, built in matrix algebra, random number generation, date arithmetic, and much more. This is version V24-01a, an update to version V23-2A on disk 176. Binary only. Author: Glenn Everhart				
RoadRoute	A trip planner that takes a list of cities and a list of known routes between cities, and generates the distance and time required to reach your destination. This is an update to version 1.0 on disk 251, with an expanded database of cities and roads for New Mexico, Texas, Oklahoma, Kansas, Nebraska, South Dakota, Louisiana, Arkansas, Missouri, Colorado and Mississippi, added by Fred Mayes and Gary Delzer. Includes source. Author: Jim Butterfield, Fred Mayes, Gary Delzer				
Fred Fish Disk 329					
CPU	Two programs, one in C and one in assembler, which check for CPU type. This version can detect 68000, 68010, 68020, and 68881 processors. Includes source. Author: Ethan Dicks, based on WhatCPU by Dave Hayne				
DiskSpeed	A disk speed testing program specifically designed to give the most accurate results of the true disk performance of the disk under test. Automatically updates and maintains an ASCII database of disk results for tested disks. This is version 3.1, an update to version 2.0 on disk 288, with some source code cleanups and stress tests for CPU and DMA. Includes source in C. Author: Michael Sinz				
Empire	This is a complete rewrite, from the ground up, in Draco, of Peter Langston's Empire game. Empire is a multiplayer game of exploration, economics, war, etc, which can last a couple of months. Can be played either on the local keyboard or remotely through a modem. This is version 1.33w, an update to version 1.0 on disk 118, and includes many changes and enhancements. Binary only. Author: Chris Gray, David Wright, Peter Langston				
FileSystems	Displays AmigaDOS disk devices with information about the head geometry, BuffMemType, and the lower level exec device. Includes source. Author: Ethan Dicks				
OnePlane	Removes the highest number bitplane from the WorkBench screen. Normally used to take WorkBench screen from 2 bitplanes to 1 bitplane. This allows CON: style devices to scroll text faster. Includes source. Author: Ethan Dicks				
Fred Fish Disk 330					
Mostra	A very versatile program to display IFF ILMB files. Features realtime unpacking scroll, smart analysis of any IFF file, total control over display modes, simple slideshow processing, pattern matching, and a dozen other options. Only 14K. This is version 1.0, an upgrade to the Show program on disk 323, and adds SHAM, double buffering, faster decompression, color cycling, TxDocs, startup files for easy customization, and complete WorkBench support through ToolTypes and Style icons. Binary only. Author: Sebastiano Vigna				
Palette	A tool which allows you to change another program's custom screen colors. This is version 1.1, an update to the version on disk 55. New features include checks for WorkBench startups, checks for HAM, Half Brite, or more than five bitplanes, and more graceful exits. Includes source in assembly. Author: Randy Joutett, CJ Fruge, Carolyn Scheppner, Charlie Heath				
Vt100	A vt100 emulator for the Amiga, which also supports various file transfer protocols like kermi, xmodem, ymodem, zmodem, etc, has an ARExx port, can use custom external protocol modules, and more. This is version 2.9a, an update to version 2.9 on disk 275. Includes source. Author: Dave Wecker, Tom Sumral, Frank Anthes, and Chuck Forsberg				
XprKermit	An Amiga shared library which provides Kermit file transfer capability to any XPR-compatible communications program. Supports version 2.0 of the XPR Protocol specification. Version 1.5, includes source. Author: Marco Papa, Stephen Walton				
Fred Fish Disk 331					
CRobots	A game based on computer programming. Unlike arcade type games which require human input controlling some object, all strategy in CRobots is condensed into a C language program that you design and write, to control a robot whose mission is to seek out, track, and destroy other robots, each running different programs. All robots are equally equipped, and up to four may compete at once. This is version 2.2w, an update to version 2.1w on disk 311. Binary only, source available from author. Author: Tom Poindexter, Amiga version by David Wright				
Csh	Version 4.01a of a csh like shell derived from Matt Dillon's shell, version 2.07. This is an update to version 4.00a on disk 309. Changes include mostly bug fixes and corrections. Includes source. Author: Matt Dillon, Steve Drew, Carlo Borro, Cesare Dieni				
It2Ex	A program to convert IFF pictures to an executable. It can handle NTSC/PAL, interlace and overscan. Version 1.0, binary only. Author: Pieter van Leuven				
LhArca	An intuitionized and faster version of lharc for the Amiga. Requires ARP library. Version 0.99a, binary only. By: Haruyasu Yoshizaki, Amiga version by Stefan Boberg				
LVR	Link Virus Remover. A program that recursively searches directories for link viruses in executable files. This is version 1.20, binary only. By: Pieter van Leuven				
NTSC-PAL	Utilities which allow Amigas with the new EGS 1Mb Agnus to easily switch between PAL and NTSC display modes. Version 1.0, includes source in assembly. Author: Nico Francois				
PatchLoadSeg	This program patches the loadseg routine to automatically detect link viruses when a program is loaded. Displays an alert when a virus is detected in a program being loaded for execution. Version 1.20, includes source. Author: Pieter van Leuven				
VirusUtils	Two programs to detect viruses on disk and in memory. VirusHunter removes all known viruses in memory. VirusKiller removes all known viruses in memory and after removing the viruses the disks can be checked without the virus copying itself to the disks. Version 3.60, binary only. Author: Pieter van Leuven				
Fred Fish Disk 332					
AnsPtrs	Some cute animated pointers. I have adopted one of them as my permanent replacement for the boring red arrow. Binary only. Author: Bob McKain				
DevPatch	A program that installs a patch for OpenWindow to check the NewWindow structure. If the title matches a specific string, the height will be forced to 45 pixels. This helps to reduce chip memory usage for programs that open overly large windows and then seldom use them. Includes source. Author: Jorrit Tyberghein, Nico Francois, P. Marivert				
Helper	A little InputEvent hack, activated via the HELP key. Originally meant to provide a unique method of giving the user help (you don't have to put that help stuff into your own program). Now also contains a color requester and a small notepad. Version 1.01, includes source. Author: Michael Balzer				
K1_Editor	An editor for the Kawai K1(m) synthesizer with two auxiliary programs for managing sound dumps. This is version 1.00, shareware, includes source. Author: Michael Balzer				
Kryptor	A small, simple and comfortable file encoder/decoder. Version 1.0, includes source. Author: Michael Balzer				
RevBut	Another InputEvent hack, giving you a toggling right mouse button. Version 1.0, includes source. Author: Michael Balzer				
Fred Fish Disk 333					
MultiPlot	A package for making 2D plots conveniently. Tim Mooney wrote the original program, which was then enhanced by Alan Baxter with a nicer user interface, support for the PLT device, and support for file conversions. Rich Champagne and Jim Miller wrote the PLT handler which emulates a plotter by accepting HP-GL commands, creating a raster image, then dumping it to any preferences supported graphics printer. This is version XLNB, an update to version XLN on disk 292, and includes many bug fixes, style changes, and enhancements. Includes source. Author: Alan Baxter, Tim Mooney, Rich Champagne, Jim Miller				
Fred Fish Disk 334					
FBM	An Amiga port of the Fuzzy PixMap image manipulation library. This package allows manipulation and conversion of a variety of color and B&W image formats. Supported formats include Sun rasterfiles, GIF, IFF, PCX, PBM bitmaps, "tag" files, and FBM files. Also has input converters for raw images, like DigView files, and output converters for PostScript and Diable graphics. Besides doing format conversion, some of the other image manipulation operations supported include rectangular extraction, density and contrast changes, rotation, quantization, halftone greyscaling, edge sharpening, and histograms. Version 0.9, binary only. Author: Michael Mauldin; Amiga port by Kenn Barry				
PPMore	A "more" replacement program that reads normal ascii text files as well as files crunched with PowerPacker. The crunched files can result in considerable disk space savings. Version 1.5, binary only. Author: Nico Francois				
PPShow	A "show" program for normal IFF ILMB files or ILMB files crunched with PowerPacker. The decrunching is done automatically as the file is read. Version 1.0, binary only. Author: Nico Francois				
Whats	A neat little utility which not only recognizes a wide variety of file types (executables, IFF, icons, zoo files, etc), but prints interesting information about the structure or contents of the recognized file types. Version 1.2a, binary only. Author: J. Tyberghein				
Fred Fish Disk 335					
BoingDemo	Demo version of a neat game due for release in March 1990. It is fully functional but the play time is limited to five minutes per play. Version 0.30, binary only. Author: Kevin Kelm, Alternate Realities				
DTC	A utility providing a simple calendar which can hold and show appointments. It may be useful in managing your time. Its chief goals were to provide day, week and month at a glance for any date between 1/1/0001 and 12/31/9999, defaulting to the current date. It is menu driven and fairly easy to use. Includes source in Fortran. Author: Mitch Wyle, Amiga port by Glenn Everhart				
SeeHear	A program to do a spectrogram of a sampled sound file. This is a graph with time on one axis, frequency on the other and the sound intensity at each point determining the pixel color. With source in C, including FFT routine. This is version 1.1. Author: Daniel T. Johnson				
Fred Fish Disk 336					
Car	A two-dimensional full screen scrolling racing game with realistic four channel stereo sound and overscan, for either NTSC or PAL Amigas. The goal is to guide your car around one of ten selected tracks. Each track has its own high score list. V2.0, binary only. By: Anders Bjerin				
FileWindow	A completely public domain file requester which may be used in any program, even commercial ones. It uses dynamically allocated memory to hold the file names so the only limitation is the amount of memory available. Includes a filter option to limit display of filenames to only ones with a specific extension. Names are automatically sorted while they are being read and displayed. Version 1.10, includes source. Author: Anders Bjerin				
MiniBlast	A shoot'em up game which runs just fine in a multitasking environment. At last you can enjoy a satisfying megablast while you are writing a boring essay. Shoot anything that moves, and if it doesn't move, shoot it anyway. This is version 1.00, binary only. Author: Anders Bjerin				
Sys	A game built on the addictive game PONGO but with several added features. You have been assigned the demanding task of cleaning viruses from your SYSOP's hard disk. To kill a virus, you simply kick a disk at it. There are fifty different levels, and on each level, the speed will increase and the viruses will be smarter and start to hunt you. Version 2.10, binary only. Author: Anders Bjerin				
Fred Fish Disk 337					
CManual	A complete C manual for the Amiga which describes how to open and work with screens, windows, graphics, gadgets, requesters, alerts, menus, IDCMP, sprites, etc. The manual consists of more than 200 pages in 11 chapters, together with more than 70 fully executable examples with source code. When unpacked, the manual and examples nearly fill up three standard Amiga floppies. This is version 1.00 and includes source for all examples. Author: Anders Bjerin				
Fred Fish Disk 338					
Cop	This is a copy of the Decus cpp, ported to the Amiga. This cpp is more powerful and complete than either of the built in cpp's in Manx or Lattice C. This is an update to the version on disk 28. It has had some ANSI features added. Includes source. Author: Martin Minow, Olaf Seibert				
SASTools	Various submissions from "Sick Amiga Soft". Includes some virus tools, some screen hacks, some small games, and miscellaneous utilities. Includes source in assembly and Modula-II. Author: Jorg Sixt				
SiD	A very comprehensive directory utility for the Amiga that supports at least a couple of dozen different commands for operating on files. Version 1.06, binary only. Author: Timm Martin				
Fred Fish Disk 339					
PCQ	A freely redistributable, self compiling, Pascal compiler for the Amiga. The only major feature of Pascal that is not implemented is sets. This is version 1.1c, an update to version 1.0 on disk 183. It is much enhanced and about four times faster. Includes the compiler source and example programs. Author: Patrick Quaid				
Fred Fish Disk 340					
NorthC	A complete freely redistributable C environment for the Amiga based on the Scobzon Ltd C compiler, Charlie Gibb's assembler, the Software Stewie's linker, and portions from other sources. Stevie has pulled everything together and added some enhancements in the process. Version 1.0, partial source only. Author: Steve Hawtin, et al.				
Pilot	A library of C functions useful for scientific plotting on the Amiga. The library is Lattice C compatible. Contour plotting, three dimensional plotting, axis redefinition, log-log plotting and multiple subpages are a few of Pilot's features. The plots can be displayed on a monitor or sent to a graphics file for subsequent printing. This is version 2.6, and update to version 1.00 on disk 222. This interface includes a greatly improved intuition interface, preferences support for hardcopy, several new device drivers, and the capability of adding additional device drivers easily. Includes source. Author: Tony Richardson				
SpeakerSim	Demo version of SpeakerSim 2.0, a loudspeaker CAD program. Simulates vented (Thiele-Small) and closed box systems. Also simulates 1st, 2nd, and 3rd order high and low pass filters. Binary only. Author: Dissidents				
To Be Continued.....					
In Conclusion					
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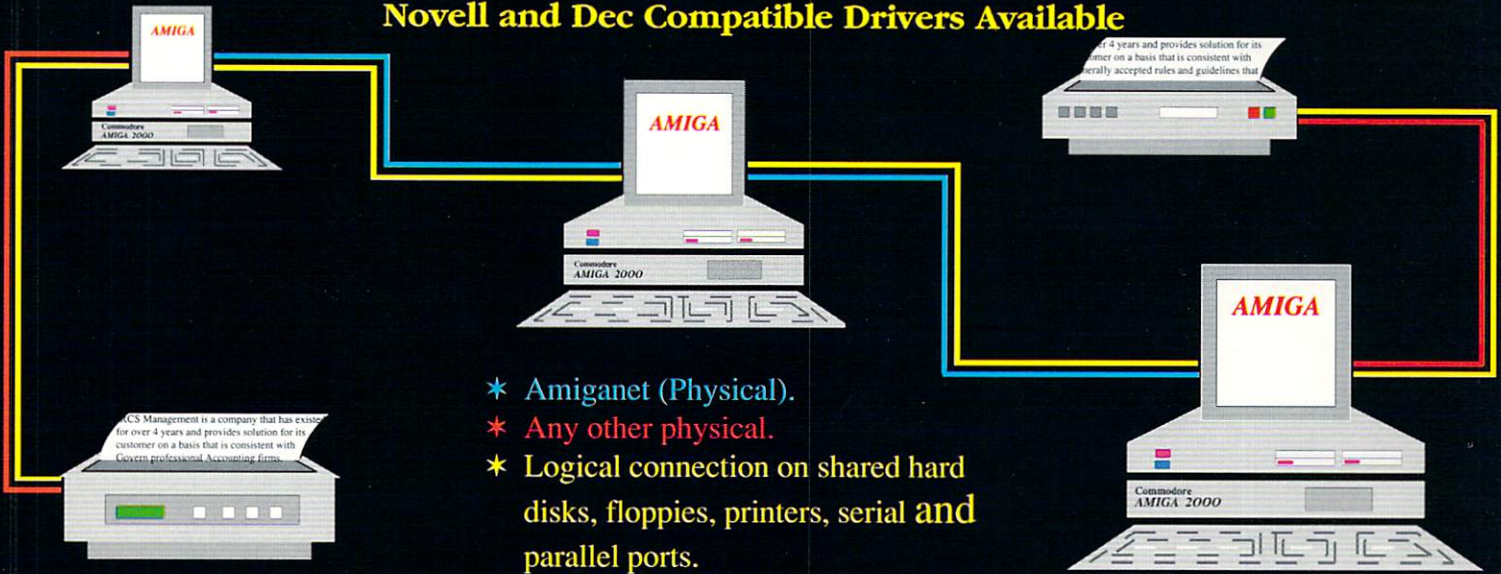
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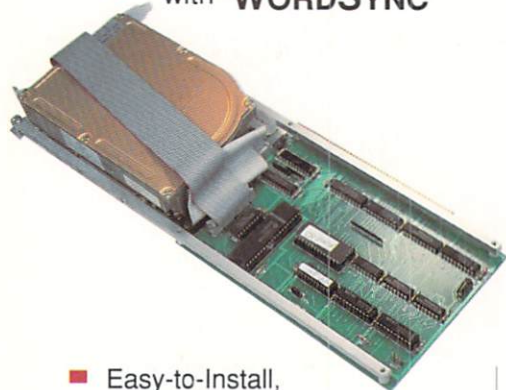
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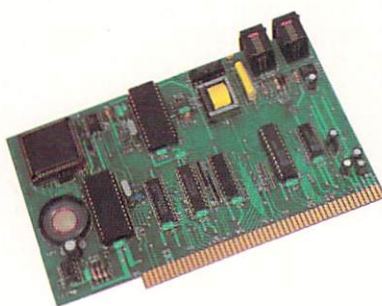
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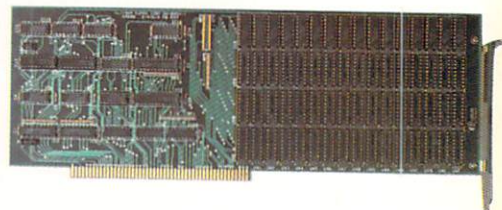
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